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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

In re Ricoh Company Ltd. Patent Litigation NO. C 03-02289 JW

**REVISED CLAIM CONSTRUCTION
AFTER RECONSIDERATION**

I. INTRODUCTION

This is a patent infringement case. Plaintiff is Synopsys, Inc. (“Synopsys”). Defendant is Ricoh Company Ltd. (“Ricoh”). Ricoh is the owner of U.S. Patent No. 4,922,432 (“the ‘432 Patent”). Ricoh alleges that Synopsys’ customers (“Customer Defendants”) are infringing certain claims of the ‘432 Patent. In response, Synopsys asserts that the ‘432 Patent is invalid, unenforceable, and not infringed by any Synopsys product, and seeks declaratory relief.

On January 18, 2005, a different Judge of this Court held a hearing in accordance with Markman v. Westview Instruments, Inc., 517 U.S. 370 (1996), to construe disputed terms and phrases of the asserted claims. The Court’s April 7, 2005 Claim Construction Order construed ten disputed terms in Claim 13 of the ‘432 Patent. (Docket Item No. 226.) On December 14, 2006, the case was stayed pending reexamination of the ‘432 Patent by the USPTO. (Docket Item No. 542.)

On February 15, 2008, the case was reassigned to Judge Ware. (Docket Item No. 544.) On April 7, 2008, the Court conducted a Case Management Conference and on motion by Synopsys, lifted the stay imposed by the previous Judge. (Docket Item No. 548.) The Court set a hearing for cross-motions for summary judgment in an attempt to bring this 2003 case to a close. (Id.)

1 Based on the construction of a particular phrase in the April 7, 2005 Claim Construction
2 Order, Synopsys filed a Motion for Summary Judgment of Noninfringement of the ‘432 Patent.
3 (Docket Item No. 571.) In the course of considering the motion, this Court determined to reconsider
4 the April 7, 2005 interpretation of the subject phrase and thus, denied Synopsys’ Motion as
5 premature. (Docket Item No. 621.) In this Order, the Court gives a revised construction of words
6 and phrases of the ‘432 Patent.

7 **II. DISCUSSION**

8 **A. The ‘432 Patent**

9 The ‘432 Patent, “Knowledge Based Method and Apparatus for Designing Integrated
10 Circuits Using Functional Specifications,” discloses as its invention “a computer-aided design
11 system and method for designing an application specific integrated circuit (“ASIC”). The language
12 under reconsideration is in Claim 13.

13 **B. Claim 13 of the ‘432 Patent**

14 Claim 13 provides:¹

15 A computer-aided design process for designing an application specific integrated circuit
16 which will perform a desired function comprising
17 storing² a set of definitions of **architecture independent actions and conditions**;
18 storing data describing a set of available integrated circuit hardware cells for performing the
19 actions and conditions defined in the stored set;
20 storing in an expert system knowledge base a set of rules for selecting hardware cells to
21 perform the actions and conditions;
22 describing³ for a proposed application specific integrated circuit a series of **architecture**
23 **independent actions and conditions**;
24 specifying for each described action and condition of the series one of said stored definitions
25 which corresponds to the desired action or condition to be performed; and
26 selecting from said stored data for each of the specified definitions a corresponding
27 integrated
28 circuit hardware cell for performing the desired function of the application specific
integrated circuit, said step of selecting a hardware cell comprising applying to the
specified definition of the action or condition to be performed, a set of cell selection
rules stored in said expert system knowledge base and generating for the selected

25 ¹ Unless otherwise indicated, all bold typeface is added by the Court for emphasis.

26 ² For ease of reference, the Court will refer to this as the “storing” step.

27 ³ For ease of reference, the Court will refer to this as the “describing” step.

1 integrated circuit hardware cells, a netlist defining the hardware cells which are
2 needed to perform the desired function of the integrated circuit and the
interconnection requirements therefor.

3 ('432 Patent, Col. 16, l. 34; Col. 13, l. 65.) (emphasis added).

4 **C. The Court's Previous Construction of a Phrase used in Claim 13 of the '432 Patent**

5 On January 18, 2005, a different Judge of this Court gave the following construction:

Disputed Claim Language	Court's Construction
"architecture independent actions and conditions"	"functional or behavioral aspects of a portion of a circuit (or circuit segment) that does not imply a set architecture, structure, or implementing technology, but excludes the use of register-transfer level descriptions as taught in Darringer."

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11 On reconsideration, the parties dispute the appropriateness of including a reference to
12 "register-transfer level descriptions" and to "Darringer" in the construction of the phrase
13 "architecture independent actions and conditions." In construing any particular phrase of a
14 limitation of a claim, the Court begins with a consideration of the '432 Patent as a whole.

15 **D. Reconsideration**

16 **1. "architecture independent"**

17 Claim 13 is not the only claim in which the inventors use the phrase "architecture
18 independent" and the phrase "actions and conditions," or some variation of those phrases, in a
19 limitation.

20 When the same words or phrases are used in different claims of the same patent, a court
21 interprets the words and phrases as having the same meaning unless it is clear from the specification
22 and prosecution history that the phrases have different meanings in the different claims. See Phillips
23 v. AWH Corp., 414 F. 3d 1303, 1314 (Fed. Cir. 2005).

24 The phrases "architecture independent" and "actions and conditions" first appear in Claim 1:

25 A computer-aided design system for designing an application specific integrated
26 circuit directly from **architecture independent** functional specifications for the
integrated circuit, comprising
27 a macro library defining a set of architecture independent operations
comprised of actions and conditions

1 input specification means operable by a user for defining **architecture**
2 **independent** functional specifications for the integrated circuit, said functional
3 specifications being comprised of a series of operations comprised of **actions and**
4 **conditions**, said input specification means including means to permit the user to
5 specify for each operation a macro selected from said macro library

6 In the Preamble to Claim 1, the inventors use the phrase “architecture independent” to
7 modify “functional specifications.” A skilled artisan would understand the Preamble of Claim 1 to
8 recite a system that designs an ASIC from “architecture independent functional specifications.” It is
9 necessary therefore, to determine what the inventors meant when they recited that these “functional
10 specifications” are “architecture independent.”

11 In the background section of the specification, the inventors recite state of the art computer-
12 aided design (CAD) systems and methods for designing an ASIC that require input from highly
13 skilled design engineers:

14 CAD techniques have been used with success in design and verification of integrated
15 circuits, at both the structural level and at the physical layout level. For example,
16 CAD systems have been developed for assisting converting VLSI structural level
17 descriptions of integrated circuits into the physical layout level topological mask data
18 required for actually producing the chip. Although the presently available computed-
19 aided design systems greatly facilitate the design process, the current practice still
20 requires highly skilled VLSI design engineers to create the necessary structural level
21 hardware descriptions.

22 (‘432 Patent, Col. 1:51-63.)

23 As an improvement over the existing state of the art, the invention is summarized as a
24 computer-aided design system and method that allows a user to define the “functional requirements”
25 for a desired ASIC, using a “sequence of logical operations” independent of the “logic,” i.e.,
26 hardware structure, that could “carry out those specific functions.” (‘432 Patent, Col. 2:7-15.) The
27 inventors pointed to a flowchart of logical operations as a preferable example of specifications that
28 are “architecture independent:”

The functional architecture independent specifications of the desired ASIC can be
defined in a suitable manner, such as in list form or preferably in a flowchart format.
The flowchart is a highly effective means of describing a sequence of logical
operations, and is well understood by software and hardware designers of varying
levels of expertise and training.

(‘432 Patent, Col. 2:21-29.)

1 In contrast to specifications that are “architecture independent,” the inventors use the phrase
2 “architecture specific” to refer to specifications that include the logic hardware cells that can
3 perform a particular function:

4 From the flowchart (or other functional specifications), the system and method of the
5 present invention translates the functional architecture independent specifications into
6 **structural an[d]⁴ architecture specific** level definition of an integrated circuit,
7 which can be used directly to produce the ASIC. The structural level definition
8 includes a list of the integrated circuit hardware cells needed to achieve the functional
9 specifications. The structural level definition includes a list of the integrated circuit
10 hardware cells needed to achieve the functional specifications. These cells are
11 selected from a cell library of previously designed hardware cells of various functions
12 and technical specifications.

13 (‘432 Patent Col. 2:34-39.)

14 The inventors’ use of the phrase “architecture dependent” to describe specifications for a
15 functional decision tree and “structural and architect specific” to describe specifications that are of
16 implementing logic components is supported by the drawings and the descriptions of the drawings.
17 The inventors label FIG. 1a, “Functional Level:”

18 A flowchart is a graphic representation of an algorithm and consists of two kinds of
19 blocks or states, namely actions and conditions (decisions). Actions are
20 conventionally represented in the flowchart by a rectangle or box, and conditions are
21 represented by a diamond. Transitions between actions and conditions are
22 represented by lines with arrows.

23 (‘432 Patent, Col. 3:52-57.)

24 The inventors label FIG. 1b “Structural Level:”

25 FIG. 1b illustrates a structural (or logic) level representation of an integrated circuit.
26 In this representation, blocks are used to represent integrated architecture specific
27 circuit hardware components for performing various function, and the lines
28 interconnecting the blocks represent paths for the flow of data or control signals
between the blocks. The blocks may, for example, represent hardware components
such as adders, comparators, registers, system controllers, etc.

(‘432 Patent, Col. 3:59-67.)

⁴ The Court finds that the article “an” would be understood to be a typographical error and should be read as the conjunction “and.”

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2. “actions and conditions”

In the “input specification means” limitation of Claim 1, the inventors state that “operations and conditions” are a series of logical operations:

. . . said functional specifications being comprised⁵ of a series of operations comprised of actions and conditions.

(‘423 Patent, Col. 14:43-44.) Consistently throughout the written description, the phrase “actions and conditions” is used to describe the state of the data being controlled by the ASIC, changed in state, and flow of the data based on the state or changes in the state.

3. “a set of definitions”

The storing step of Claim 13, recites “storing **a set of definitions** of architecture independent actions and conditions.” In the written description, the inventors variously describe a “data base”⁶ that contains “design data (flowchart, logic, etc).”⁷ The flowchart is described as being created by a “Flowchart Editor.” In the written description, “macro names and arguments”⁸ are described as data from which a flowchart would be created. A person of ordinary skill in the art would understand macros and arguments as computer instructions. These macros are stored in a macro library.⁹ Thus, one skilled in the art would understand “a set of definitions” to mean “a set of computer instructions such as macros and arguments.”

There is nothing in the ‘432 Patent documents that indicates that the inventors intended any different meaning of “architecture independent” or of “actions and conditions” in Claim 13.

⁵ In patent claims, the word “comprising” is open ended; it includes the recited elements and additional elements. AGF Industries, Inc. v. Cardinal IG Company, 239 F.3d 1239, 1250 (Fed. Cir. 2001).

⁶ (‘432 Patent, Col. 5:63.)

⁷ (‘432 Patent, Col. 5:65.)

⁸ (‘432 Patent, Col. 7:25-26.)

⁹ (‘432 Patent, Col. 7:28.)

1 Accordingly, as used in Claim 13 of the '432 Patent, the Court construes the phrase **“storing**
2 **a set of definitions of architecture independent actions and conditions”** to mean:

3 **storing a set of instructions of actions or conditions to which a circuit could be**
4 **subjected that are not dependent on any particular arrangement of hardware**
5 **cells to perform the actions or create or maintain the conditions.**

6 **4. “describing”**

7 Claim 13 recites as one of the steps in the method: **“describing** for a proposed application
8 specific integrated circuit a series of architecture independent actions and conditions.” The parties
9 have not requested the Court to determine whether this step is performed by a user or whether it
10 describes a further storing step. Therefore, the Court reserves the construction of the word
11 “describing” as used in this limitation for later consideration. With respect to the phrase “a series of
12 architecture independent actions and conditions,” the Court gives to it the same construction as used
13 in the storing step.

14 **E. Reference to Register-Transfer Level and Darringer**

15 At issue is whether the Court should reconsider the reference to register-transfer level
16 (“RTL”) and Darringer in the construction of Claim 13.

17 A clear and unambiguous limitation of the scope of a claim made during prosecution of the
18 claim may be used as a basis to narrow the scope of the claim. Seachange Int’l, Inc. v. C-Cor, Inc.,
19 413 F.3d 1361, 1373 (Fed. Cir. 2005).

20 During the prosecution of the '432 Patent, claims were rejected as obvious based on
21 Darringer, U.S. Patent No. 4,703,435. In response, the inventors distinguished their invention from
22 Darringer and others that required user input at what was referred to as the “register transfer level:”

23 It is respectfully submitted that based upon the Darringer reference, the present
24 invention would not be obvious to one skilled in the art. Although Darringer et al.,
25 does disclose a method and system for automatic logic design and it is known in the
26 art of automatic layout to utilize sell libraries of circuit components, Darringer does
27 not teach the present invention. A very clear distinction between Darringer and the
28 present invention is that the input to the Darringer system is in the form of a register
transfer level flowchart control language. Darringer et al., U.S. patent No. 4,703,435,
column 4, lines 26-32. In order for a designer to utilize the Darringer system, he/she
must possess a sophisticated understanding of the complexities of the circuit logic
itself and therefore have the specialized expert knowledge of a highly skilled VLSI
design engineer. In contrast, the application specific circuit designer utilizing the

1 present invention need not possess any expertise common among highly skilled VLSI
2 design engineers since input to the present invention is in the form of an architecture
independent functional specification.

3 (Declaration of Richard G. Frenkel, Ex. 5, Prosecution History, Docket Item No. 628.) Similar
4 distinctions were made to other prior art references.

5 The Court finds that it is unnecessary to incorporate into its construction of “architecture
6 independent” any reference to “register-transfer level descriptions” or “Darringer.” A person of
7 ordinary skill in the art would understand that any system for designing an ASIC that requires the
8 user to input information based on the user having an understanding of the flow of data through
9 registers, logic gates or any other hardware *a fortiori* would not be “architecture independent.”

10 To the extent it can be argued that certain statements in the written description support the
11 conclusion that reference to RTL is necessary, the Court finds it unpersuasive. For example, the
12 written description provides:

13 The cell selector maps the blocks to cells selected from the cell library 34. It selects
14 an optimum cell for a block. This involves the formulation of rules for selecting
appropriate cells from the cell library. Four types of information are stored for each
cell. These are:

- 15 (1) functional level information: description of the cell at the **register transfer level**.
- 16 (2) logic level information; description in terms of flip-flops and gates.
- (3) circuit level information: description at the transistor level.
- 17 (4) Layout level information: geometrical mask level specification.

18 (‘432 Patent, Col. 9:21-34.) This reference in the written description to a “register transfer level”
19 describes an embodiment of the operation of the invention relevant to a construction of the
20 “selecting” step of Claim 13, not to the “storing” step or the “describing” step. The claims of the
21 invention do not preclude all use of register-transfer level descriptions or other architecture
22 dependent descriptions. The cited references to RTL are not relevant to construing the “storing” or
the “describing” step.

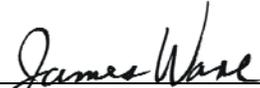
23 III. CONCLUSION

24 The Court has given further consideration to its construction of words and phrases of the
25 ‘432 Patent. On **November 23, 2009 at 10 a.m.**, the parties shall appear for a Case Management
26 Conference to discuss further proceedings in the case. On or before **November 13, 2009**, the parties
27

1 shall file a Joint Case Management Conference. The Statement shall include, among other things,
2 the parties' proposed schedule for how this case should proceed, and an update on the parties'
3 settlement efforts, if any.

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Dated: October 23, 2009



JAMES WARE
United States District Judge

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Dated: October 23, 2009

Richard W. Wieking, Clerk

By: /s/ JW Chambers
Elizabeth Garcia
Courtroom Deputy