

**Keywords: abstract idea, performed mentally, 35 U.S.C. § 101**

**General: Claims directed to methods that can be performed mentally are likely to be invalid under § 101.**

*Synopsys, Inc. v. Mentor Graphics Corp.*

United States Court of Appeals for the Federal Circuit

No. 2015-1599

Decided: October 17, 2016

**I. Background**

Synopsys, Inc. (“Synopsys”) brought an action against Mentor Graphics Corp. (“Mentor”) in December 2012 alleging infringement of various asserted claims of a group of patents called the Gregory Patents. The Gregory Patents all share a common specification. In general, the patents relate to the logic circuit design process, and more specifically to the methods for converting functional descriptions of a logic circuit into an arrangement of physical hardware components that perform the logic circuit’s functions.

In the early days of logic circuits, designers were required to specify a design in detail using schematic diagrams that identified individual hardware components or a set of logic equations. A fabrication facility would then build the corresponding physical circuit based on the detailed design. As logic circuits became more complex, designers began to focus more on higher-level functionality rather than detailed schematics. This led to hardware description languages (“HDLs”) that designers could use to describe a logic circuit at a functional level by describing only the desired operation without having to specify physical components. This in turn led to a computerized design tool that could translate the functional description into a detailed design. The Gregory Patents describe a scheme or way to translate HDL-based functional descriptions of logic circuits into physical hardware components without requiring a designer to actually specify any hardware components.

Claim 1 of the ‘841 patent was agreed to be representative of all asserted claims and recites:

A method for converting a hardware independent user description of a logic circuit, that includes flow control statements including an IF statement and a GOTO statement, and directive statements that define levels of logic signals, into logic circuit hardware components comprising:

converting the flow control statements and directive statements in the user description for a logic signal Q into an assignment condition AL(Q) for an asynchronous load function AL( ) and an assignment condition AD(Q) for an asynchronous data function AD( ); and

generating a level sensitive latch when both said assignment condition AL(Q) and said assignment condition AD(Q) are nonconstant;

wherein said assignment condition AD(Q) is a signal on a data input line of said flow through latch;

said assignment condition AL(Q) is a signal on a latch gate line of said flow through latch; and

an output signal of said flow through latch is said logic signal Q.

**District Court proceedings:**

The district court did not construe any claim of the Gregory Patents to require the use of a computer - general purpose or otherwise - or any other type of hardware. This claim construction was not challenged by the parties.

Both Synopsys and Mentor moved for summary judgement on Mentor's defense that the Gregory Patents were invalid under 35 U.S.C. § 101. The district court applied the two-step analysis described in *Alice Corp.* Under the first step of the *Alice* test, the district court observed that each of the claimed methods could be performed by a skilled designer either mentally or with pencil and paper, and found that "the claims were directed to a mental process . . . a subcategory of unpatentable abstract ideas." Under the second step of the *Alice* test, the district court found that while the claims were directed to a "specific" mental process, they nonetheless "preempted a building block of human ingenuity," and that the claims concerned "well-understood, routine, conventional activity, previously engaged in by those in the field." Therefore, the district court granted Mentor's motion and invalidated all asserted claims of the Gregory Patents.

**II. Issue**

Did the district court err in finding invalidity of the asserted claims of the Gregory Patents under § 101?

**III. Discussion**

No. The Federal Circuit held that the district court did not err in finding that the asserted claims are directed to an abstract idea and contain no inventive concept, and are therefore invalid under § 101. The court applied the two-step framework from *Alice*. Under the two-step framework, the court must first determine whether the claims at issue are directed to a patent-ineligible concept, and if so, the court must then consider the elements of each claim both individually and as an ordered combination to determine whether the additional elements "transform the nature of the claim" into a patent-eligible application.

Under step one of the *Alice* test, the court found that the claims are directed to the abstract idea of translating a functional description of a logic circuit into a hardware component description of the logic circuit, which is a mental process. Relying on *TQP Development, LLC*, Synopsis disputed the district court's characterization as a mental process by arguing that the complexity of the claimed methods would make it implausible for a skilled logic circuit designer to perform the methods mentally or with pencil and paper. The court stated that the limited, straightforward nature of the steps for generating a representation of a single hardware component make it evident that a skilled artisan could perform them mentally and distinguished it from the several-step manipulation of data of *TQP* that could not conceivably be performed in the human mind or with pencil and paper. The court further mentioned that the inventors of the Gregory Patents confirmed this when they admitted to performing them mentally themselves.

Synopsys then argued that even if the asserted claims could be performed mentally, they would, in practice, be performed on a computer. The court noted that while it may be correct that the methods of the Gregory Patents were intended to be used with a computer-based design tool, the asserted claims do not call for any computer implementation and Synopsis never sought a construction that the asserted claims must require a computer to perform the recited steps. The court found that the claimed steps were so broad as to read on an individual performing the steps mentally or with pencil and paper. The court further noted that even though a circuit designer may not use the specific method claimed when translating an HDL description into a hardware

component description does not change this result, as the Supreme Court rejected this argument in *Gottschalk*.

Synopsys attempted to argue that the asserted claims do not preempt all conversions from functional HDL descriptions to hardware component descriptions of logic circuits. However, the court asserted that “[w]hile preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility. . . [w]here a patent’s claims are deemed only to disclose patent ineligible subject matter . . . preemption concerns are fully addressed and made moot.” For these reasons, the court concluded that the asserted claims of the Gregory Patents were directed the abstract idea of a mental process.

Under step two of the *Alice* test, Synopsys tried to argue that the asserted claims contained an inventive concept because they were not shown to have been anticipated by the prior art. However, the court asserted that this misstates the law and that although a § 101 inquiry may sometimes overlap with a § 102 novelty inquiry, a claim for a new abstract idea is still an abstract idea. The court then distinguished the asserted claims from the decisions in *DDR Holdings* and *BASCOM*, where they found that the claims at issues involved a technical solution that overcame a specific challenge unique to the field and that an inventive concept can be found in the non-conventional and non-generic arrangement of known conventional pieces that overcomes defects in prior art embodiments. The court stated that the asserted claims in contrast contain no such technical solution.

#### **IV. Conclusion**

The Federal Circuit found that the asserted claims of the Gregory Patents were directed to the abstract idea a mental process and did not contain an inventive concept to transform the nature of the claim into a patent-eligible application. The court affirmed the invalidation of the asserted claims under § 101. The court reached this conclusion largely based on its findings that the claimed steps could be performed mentally or with pencil and paper and that the claims were not construed to include any computer implementation.