

Keywords: claim construction; functional claims; computer-related claims

General: An allegedly infringing product does not infringe a claim directed to a hardware-software combination if the product does not include software to enable the hardware to perform the recited functionality of the claim.

Nazomi Commc'ns, Inc. v. Nokia Corp.
No. 2013-1165 (Fed. Cir. January 10, 2014)

I. Facts

Nazomi owns the '362 and '436 patents, which are directed to systems and methods for translating Java bytecodes into a machine-readable form that can be executed by a computer processor. Traditionally, computer programs are written first in a high-level programming language ("source code") that is then compiled into the machine-readable form ("machine code") by a compiler. Unfortunately, different processors require the use of different compilers. To overcome these limitations, Java is a high-level programming language that is compiled into bytecodes instead of source code. A Java Virtual Machine ("JVM") is then used to translate the bytecodes into source code. Because the JVM produces the processor-specific machine code, Java can run on almost any platform because the bytecodes are not processor-specific.

The Java bytecodes use stack-based memory systems rather than the more common register-based systems. As such, the stack-based bytecodes must be translated into register-based instructions by the JVM software to be used on register-based devices, which is slower than executing programs that can run without translation. To address this issue, hardware-based JVM accelerators have been developed, but they may not be able to handle register-based instructions not written in Java. Thus, the '362 and '436 patents provide a hardware-based JVM accelerator that can process both stack-based instructions and register-based instructions without using the JVM.

Claim 48, which is representative of the claims at issue in the '362 and '436 patents, is reproduced below:

A central processing unit (CPU), capable of executing a plurality of instruction sets comprising:

an execution unit and associated register file, the execution unit to execute instructions of a plurality of instruction sets, including a stack-based and a register-based instruction set;

a mechanism to maintain at least some data for the plurality of instruction sets in the register file including maintaining an operand stack for the stack-based instructions in the register file and an indication of a depth of the operand stack;

a stack control mechanism that includes at least one of an overflow and underflow mechanism, wherein at least some of the operands are moved between the register file and memory; and

a mechanism to generate an exception in respect of selected stack-based instructions.

Defendants Western Digital ("Western") and Sling Media ("Sling") produce consumer products that include processors with designs licensed by ARM Limited. In 2000, ARM developed a processor with a bytecode accelerator named "Jazelle." The ARM processors are used in a wide variety of products and thus, typically include functionality, such as the Jazelle hardware, that is not utilized by every manufacturer. Instead, the Jazelle hardware requires the Jazelle Technology

Enabling Kit (“JTEK”) software to be used. In the Western and Sling products, the JTEK software was never installed and thus, the Jazelle hardware was never enabled for use.

Nazomi filed suit in 2010 against various technology companies including Western and Sling alleging infringement of the ‘362 and ‘436 patents. Western and Sling filed a motion of summary judgment contending that the accused products do not include the JTEK software and Nazomi filed an opposing motion arguing that the claims of the ‘362 and ‘436 patents only claim the hardware to perform the claimed functionality and that the Jazelle hardware alone infringed the patents. The district court granted the motion by Western and Sling and found that the accused products do not infringe the ‘362 and ‘436 patents. Nazomi appealed.

II. Issues

- A. Did the district court err by construing the claims as claiming an apparatus that includes both hardware and software capable of practicing the claimed functionality?
- B. Did the district court err by finding the products by Western and Sling as non-infringing?

III. Discussion

- A. No. The Federal Circuit reviewed the claim construction issue de novo. Specifically, the court found that each functionality recited in the claim is properly interpreted as a claim limitation and that software was required in practicing several of the claim limitations, such as “to execute instructions of a plurality of instruction sets, including a stack-based . . . set,” “maintaining an operand stack for the stack-based instructions,” and “a stack control mechanism.” In other words, the court found that hardware alone could not perform these functionalities. Thus, since software was required, the court found that the claims were properly construed as including a combination of hardware and software. In addition, the court found that the specification supported the need for these functionalities. For example, the specification stated that the Java hardware accelerator could perform tasks mirroring those in the claim.

With respect to the arguments presented by Nazomi, the court found that the claims at issue are not directed to an apparatus with hardware “programmable” to process particular instructions. *See Intel Corporation v. U.S. International Trade Commission*, 946 F.2d 821, 832 (Fed. Cir. 1991). Further, the court found that the claims do not encompass “hardware that contemplates an environment where it could be combined with software.” *See Silicon Graphics, Inc. v. ATI Technologies, Inc.*, 607 F.3d 784, 794-95 (Fed. Cir. 2010).

- B. No. The Federal Circuit pointed out that it was undisputed that the Jazelle hardware is physically present in the ARM processors, but that the Jazelle hardware is not functional without the JTEK software. The court then addressed arguments presented by Nazomi. Specifically, Nazomi argued that an apparatus claim directed to a computer is infringed if the allegedly infringing product “is designed in such a way as to enable the user of that [product] to utilize the function without having to modify the product.” (quoting *Silicon Graphics*). However, the court found that the installation of the JTEK software *is* a modification of the product. For example, the JTEK software could not be simply unlocked or accessed by purchasing a key. *See Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1205 (Fed. Cir. 2010). Instead, the court stated that “the structure (*i.e.*, JTEK software) necessary to enable Jazelle hardware to process stack-based instructions . . . is not only inactive, it is not even present on the accused products.” Thus, the court found no infringement by Western or Sling.

IV. Concurrence

Judge Lourie found that the claim limitation of “capable of executing a plurality of instruction sets” was not met by Jazelle hardware that is not functional without the JTEK software without addressing whether the purchase and installation of the JTEK software constituted a modification.

V. Conclusions

Only an accused product that includes both hardware and software can infringe apparatus claims that include functionalities that require both hardware and software.

With respect to claims drafting, consider keeping system and method limitations in separate claim sets. For example, system claims may be more suitable for hardware and method claims for software. Thus, the Jazelle hardware may have been found infringing of a system claim that only included the structural components of the JVM accelerator developed by Nazomi, assuming that such a claim was patentable. Similarly, consider the intended infringer when drafting claims and do not include unnecessary functionalities. In addition, consider using the term “programmable” in claims to cover potentially infringing products that *could* be programmed with the claim functionality, but that do not include it. Further, when appropriate, the specification can be used to emphasize that any recited functionality is merely a capability of the hardware and not a necessary feature.