

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* BRUCE LEROY BEUKEMA, WEN-TZER THOMAS CHEN,  
DANNY MARVIN NEAL, and RENATO JOHN RECIO

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Appeal 2007-3290  
Application 10/195,163<sup>1</sup>  
Technology Center 2100

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Decided: March 14, 2008

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Before JOSEPH L. DIXON, JEAN R. HOMERE, and JAY P. LUCAS,  
*Administrative Patent Judges.*

HOMERE, *Administrative Patent Judge.*

DECISION ON APPEAL

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<sup>1</sup> Filed Jul. 11, 2002. The real party in interest in this appeal is International Business Machines Corp.

## STATEMENT OF CASE

Appellants appeal under 35 U.S.C. § 134 from the final rejection of claims 1 through 26. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

### The Invention

According to Appellants, as depicted in Figure 5, the invention relates to a method and apparatus for testing a switched area network device (500) containing a standardized serial fabric interconnect (504), a test mode logic (508), and a plurality of logic modules. (Spec. 4, 7.) Upon receiving a test logic command from an external tester (502) via the standardized fabric interconnect (504), the test mode logic (508) executes the command to test a respective logic module, and subsequently returns the result to the tester (502) via the standardized fabric interconnect (504). (*Id.* 13.)

Independent claim 1 is illustrative of the invention, and it reads as follows:

1. A method, in a system area network (SAN) that includes a plurality of channel-based, switched fabric devices, each one of said plurality of channel-based, switched fabric devices including a standardized channel-based, switched fabric serial fabric interconnect for communicating with other ones of said plurality of channel-based, switched fabric devices, for testing a particular channel-based, switched fabric device that includes a plurality of logic modules, said method comprising the steps of:

coupling said plurality of channel-based, switched fabric devices

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together utilizing said standardized channel-based, switched fabric serial fabric interconnect that is included within each one of said plurality of channel-based, switched fabric devices;

ones of said plurality of channel-based, switched fabric devices communicate with other ones of said plurality of channel-based, switched fabric devices utilizing said standardized channel-based, switched fabric serial fabric interconnect that is included within each one of said plurality of channel-based, switched fabric devices;

including test mode logic in said particular device;

receiving within said test mode logic via said standardized channel-based, switched fabric serial fabric interconnect a test command from a tester that is external to said particular device; and

testing, utilizing said test mode logic, at least one said plurality of logic in response to said receipt of said test command..

The Examiner relies upon the following prior art in rejecting the claims on appeal:

Mann	US 5,978,902	Nov. 02, 1999
Parthasarathy	US 6,831,916 B1	Dec. 14, 2004 (filed Sep. 28, 2000)

The Examiner rejects the claims on appeal as follows:

Claims 1 through 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Mann and Parthasarathy.

## FINDINGS OF FACT

The following Findings of Fact (FF) are shown by a preponderance of the evidence.

### *Mann*

1. Mann discloses an external host system (111) containing a debug control software (112). The external host (111) communicates with a target system (101) via a serial link (110) to debug information obtained in a processor (102) located in the target system (101). (Col. 5, ll. 1-4.) As depicted in Figure 1, the serial link (110) is connected to the target system (101) by means of a serial connector (108), which is subsequently attached to a debug port (100) contained in the processor (102). (Col. 5, ll. 4-10.)

2. Mann discloses that the serial connector (108) can be replaced with a higher speed Joint Test Action Group (JTAG) to network conversion equipment. (Col. 5, ll. 10-12.) Mann further discloses that the debug port (100) includes an IEEE-1149.1-1990 compliant JTAG interface, which is a standardized serial port interface. (Col. 4, ll. 65-67.) Conventional JTAG pins in a fast JTAG interface carry test signals and provide controllability and observability. Additionally, the JTAG interface improves software debug capabilities and transfers high level commands into the processor core. (Col. 5, ll. 39-52.)

*Parthasarathy*

3. As admitted by Appellants, Parthasarathy discloses a channel-based, switched-fabric serial fabric interconnect in a system area network (SAN). (App. Br. 13.) Particularly, as depicted in Figure 2, the SAN includes a switched fabric (100') that allows a host system (130) to communicate to a large number of other hosts systems via a plurality of channels adapters (HCA, TCA). (Col. 4, ll. 46-55.)

4. The channel adapters may be used to provide an interface between the switched fabric (100') and devices of a second network (150) via high speed serial NGIO/Infiniband links. (Col. 5, ll. 38-46.)

PRINCIPLES OF LAW

Appellants have the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection [under § 103] by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.") (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)).

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said

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subject matter pertains.”” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S. Ct. at 1734 (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”)

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”). *Leapfrog Enter., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007) (quoting *KSR Int’l v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41(2007)). “One of the ways in which a patent’s subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent’s claims.” *KSR*, 127 S. Ct. at 1742.

Discussing the obviousness of claimed combinations of elements of prior art, *KSR* explains:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary

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skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida* [v. *AG Pro, Inc.*, 425 U.S. 273 (1976)] and *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 (1969)] are illustrative—a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

*KSR*, 127 S. Ct. at 1740. Where the claimed subject matter cannot be fairly characterized as involving the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement, a holding of obviousness can be based on a showing that there was “an apparent reason to combine the known elements in the fashion claimed.” *KSR*, 127 S. Ct. at 1741. Such a showing requires “some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.*, 127 S. Ct. at 1741 (quoting *In re Kahn*, 441 F.3d 977, 987(Fed. Cir. 2006)).

The reasoning given as support for the conclusion of obviousness can be based on interrelated teachings of multiple patents, the effects of demands known to the design community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art. *KSR*, 127 S. Ct. at 1740-41. See also *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2007).

We note our reviewing court has recently reaffirmed that:

[A]n implicit motivation to combine exists not only when a suggestion may be gleaned from the prior art as a whole, but when the

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‘improvement’ is technology-independent and the combination of references results in a product or process that is more desirable, for example because it is stronger, cheaper, cleaner, faster, lighter, smaller, more durable, or more efficient. Because the desire to enhance commercial opportunities by improving a product or process is universal—and even common-sensical—we have held that there exists in these situations a motivation to combine prior art references even absent any hint of suggestion in the references themselves. In such situations, the proper question is whether the ordinary artisan possesses knowledge and skills rendering him capable of combining the prior art references.

*Leapfrog*, 485 F.3d at 1162 (holding it “obvious to combine the Bevan device with the SSR to update it using modern electronic components in order to gain the commonly understood benefits of such adaptation, such as decreased size, increased reliability, simplified operation, and reduced cost”).

Also, a reference may suggest a solution to a problem it was not designed to solve and thus does not discuss. *KSR*, 127 S. Ct. at 1742 (“Common sense teaches . . . that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. . . . A person of ordinary skill is also a person of ordinary creativity, not an automaton.”).

The prior art relied on to prove obviousness must be analogous art. As explained in *Kahn*,

the ‘analogous-art’ test . . . has long been part of the primary Graham analysis articulated by the Supreme Court. *See Dann [v. Johnston,]* 425 U.S. [219,] 227-29 (1976), *Graham*, 383 U.S. at 35. The analogous-art test requires that the Board show that a reference is either in the field of the applicant's endeavor or is reasonably pertinent to the problem with which the inventor was concerned in order to rely on that reference as a basis for rejection. *In re Oetiker*, at 1447. References are selected as being reasonably pertinent to the problem based on the judgment of a person having ordinary skill in the art. *Id.* (“[I]t is necessary to consider ‘the reality of the circumstances,’—in other words, common sense—in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor.” (quoting *In re Wood*, 599 F.2d 1032 (C.C.P.A. 1979))).

*Kahn*, 441 F.3d at 986-87. *See also In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992) (“[a] reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem.”).

In view of KSR’s holding that “*any* need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed,” 127 S. Ct. at 1742 (emphasis added), it is clear that the second part of the analogous-art test as stated in *Clay, supra*, must be expanded to require a determination of whether the reference, even though it may be in a different field from that of the inventor's endeavor, is one which, because of the

matter with which it deals, logically would have commended itself to an artisan's (not necessarily the inventor's) attention in considering *any* need or problem known in the field of endeavor. Furthermore, although under *KSR* it is not always necessary to identify a known need or problem as a motivation for modifying or combining the prior art, it is nevertheless always necessary that the prior art relied on to prove obviousness be analogous. *See KSR*, 127 S. Ct. at 1739. (“The Court [in *United States v. Adams*, 383 U.S. 39, 40 (1966)] recognized that when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another *known in the field*, the combination must do more than yield a predictable result.”) (emphasis added). *See also Sakraida*, 425 U.S. at 280 (“Our independent examination of that evidence persuades us of its sufficiency to support the District Court's finding ‘as a fact that each and all of the component parts of this patent . . . were old and well-known throughout the dairy industry long prior to the date of the filing of the application for the Gribble patent.’”).

#### ANALYSIS

Independent claim 1 requires in relevant part receiving within a test mode logic a test command from an external tester via a standardized channel-based, switched fabric serial interconnect. (App. Br., Claims Appendix.) Appellants argue that the combination of Mann and Parthasarathy does not teach that limitation. (App. Br. 12-13.) Particularly,

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Appellants argue that even though the references may individually disclose separate portions of the cited limitation, there is insufficient rationale for combining them in the manner suggested by the Examiner. (*Id.* 13.)

Therefore, Appellants submits that the combination of Mann and Parthasarathy does not render claim 1 unpatentable. (*Id.*)

In response, the Examiner avers that Mann discloses an external host system for testing a processor of a target system via a standardized serial port JTAG interface. Further, the Examiner finds that Parthasarathy discloses a channel-based, switched-fabric serial fabric interconnect in a system area network for allowing a host system to communicate with other hosts via a serial channel. The Examiner therefore concludes that one of ordinary skill in the art would have combined the teachings of Mann and Parthasarathy to render the claim unpatentable. (Ans. 25-26.)

Therefore, the pivotal issue before us is:

Whether one of ordinary skill in the art would have found sufficient rationale to combine the disclosures of Mann and Parthasarathy in the manner suggested by the Examiner to arrive to a test mode logic that receives a test command from an external tester via a standardized channel-based, switched fabric serial interconnect? We answer this inquiry in the affirmative.

As set forth in the Findings of Fact section above, Mann discloses a processor core of a target system that receives a test command from an external host via a standardized serial JTAG interface. (FF 1-2.) Mann also

teaches that the JTAG interface enhances testing capabilities by sending high level commands to the processor core. (FF. 2.) Further, as admitted by Appellants, Parthasarathy discloses a channel-based, switched fabric serial interconnect for allowing a host to communicate with other hosts of a SAN and devices of a second network via a serial high speed serial links (FF. 3-4.)

One of ordinary skill in the art would have aptly recognized that Mann's apparatus, taken in combination with Parthasarathy's disclosure, would have *predictably resulted*<sup>2</sup> in a core processor for receiving a test command from an external host via a standardized channel-based, switched fabric serial fabric interconnect. Thus, on the record before us, we conclude that the ordinarily skilled artisan would have found sufficient rationale to combine the prior art elements of Mann and Parthasarathy, as they are disclosed to perform known functions that achieve a predictable result.<sup>3</sup> Therefore, Appellants' argument that the combination of the references is a result of impermissible hindsight is not persuasive.

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<sup>2</sup> [The Supreme Court has held that in analyzing the obviousness of combining elements, a court need not find specific teachings, but rather may consider "the background knowledge possessed by a person having ordinary skill in the art" and "the inferences and creative steps that a person of ordinary skill in the art would employ." *See KSR Int'l v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-41 (2007). To be nonobvious, an improvement must be "more than the predictable use of prior art elements according to their established functions." *Id.* at 1740.

<sup>3</sup> *Id.*

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Further, Appellants argue that Mann and Parthasarathy are not analogous art. (App. Br. 14.) This argument is unavailing. We agree with the Examiner that, at the time of the present invention, the ordinarily skilled artisan would have looked to the teachings of the cited references for a suggestion regarding which of the known interfaces could more effectively allow an external host to transfer commands to test the processor core of a target system. It follows that Appellants have not shown that the Examiner erred in finding that the combination of Mann and Parthasarathy renders independent claim 1 unpatentable.

Appellants did not provide separate arguments for claims 2 through 26. We therefore select claim 1 as representative of the cited claims. It follows that claims 2 through 26 fall with representative claim 1. See 37 C.F.R. § 41.37(c)(1)(vii).

#### SUMMARY

Appellants have not shown that the Examiner erred in concluding that claims 1 through 26 are unpatentable under 35 U.S.C. § 103(a) over the combination of Mann and Parthasarathy.

#### DECISION

We affirm the Examiner's decision rejecting claims 1 through 26.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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