

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHAEL S. BERTONE
and RICHARD E. KESSLER

Appeal No. 2006-0614
Application No. 09/652,834

ON BRIEF

Before JERRY SMITH, DIXON, and SAADAT, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-16, which constitute all the claims pending in this application.

The disclosed invention pertains to a distributed multiprocessing computer system having a plurality of processor nodes, each of which is coupled to an associated memory module which may store data that is shared between the processor nodes.

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The invention relates to the manner of maintaining a coherence directory for a data block associated with a Home processor node which receives a request for the data block from a Requestor processor node.

Representative claim 1 is reproduced as follows:

1. A distributed multiprocessing computer system, comprising:
a plurality of processor nodes each coupled to an associated memory module, wherein each memory module may store data that is shared between said processor nodes;
a Home processor node that includes a data block and a coherence directory for said data block in an associated memory module;
an Owner processor node that includes a copy of said data block in a memory module associated with the Owner processor node, said copy of said data block residing exclusively in said memory module;
a Requestor processor node that encounters a read or write miss of said data block and requests said data block from the Home processor node; and
wherein said Home processor node receives the request for the data block from the Requestor processor node, forwards the request to the Owner processor node for the data block and performs a speculative write of the next directory state to the coherence directory for the data block without waiting for the Owner processor node to respond to the request.

The examiner relies on the following references:

Arimilli et al. (Arimilli)	5,895,484	Apr. 20, 1999
Cherabuddi et al. (Cherabuddi)	6,496,917	Dec. 17, 2002 (filed Feb. 07, 2000)

Claims 1-16 stand rejected under 35 U.S.C. § 103(a). As evidence of obviousness the examiner offers Cherabuddi in view of Arimilli.

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Rather than repeat the arguments of appellants or the examiner, we make reference to the brief and the answer for the respective details thereof.

OPINION

We have carefully considered the subject matter on appeal, the rejection advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellants' arguments set forth in the brief along with the examiner's rationale in support of the rejection and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in the claims on appeal. Accordingly, we reverse.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth

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in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. See Id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472,

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223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976). Only those arguments actually made by appellants have been considered in this decision. Arguments which appellants could have made but chose not to make in the brief have not been considered and are deemed to be waived [see 37 CFR § 41.37(c)(1)(vii)(2004)].

The examiner has indicated how the claimed invention is deemed to be rendered obvious by the collective teachings of the applied prior art. Specifically, the examiner finds that Cherabuddi teaches the claimed invention except for the claimed cache directory. The examiner cites Arimilli as teaching a method and system for speculatively sourcing cache memory data that includes a cache directory lookup functionality and the speculative sourcing of data among cache memories. The examiner finds that it would have been obvious to the artisan to incorporate the speculatively updateable cache directory of Arimilli into the Cherabuddi system [answer, pages 4-5].

With respect to claims 1, 3, 5, 7 and 10, which are argued as a single group by appellants, appellants argue that Cherabuddi does not even discuss cache directories, reading or writing from cache directories, or speculatively reading/writing cache directories. They also argue that Arimilli relates to

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speculatively reading from memory, not writing to memory, and that Arimilli updates the directory after it is determined that a retry is not present and after the speculative data sourcing is completed. Appellants then assert that the wherein clause of claim 1 is not "disclosed in either Cherabuddi or Arimilli." They argue that neither reference teaches speculatively writing anything, and certainly not speculatively writing a next directory state [brief, pages 10-12].

The examiner responds that the Cherabuddi memory means would obviously include a directory table for address location purposes. The examiner asserts that Cherabuddi discloses a method for maintaining data coherency through speculatively writing data, which remains speculative until validated. The examiner also responds that the read with the intent to modify (RWITM) requests of Arimilli clearly require a modification or writing. The examiner disagrees with appellants' argument that the directory update in Arimilli is not done speculatively. The examiner asserts that the intervention response and cache housekeeping in Arimilli both occur prior to the retry [answer, pages 8-12].

We will not sustain the examiner's rejection of claims 1, 3, 5, 7 and 10 for essentially the reasons argued by appellants in

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the brief. Specifically, we agree with appellants that neither Cherabuddi nor Arimilli teaches performing a speculative write of the next directory state to the coherence directory for the data block as claimed. Cherabuddi teaches that speculative read requests are cancelled if a write request is received before the speculative read request, whereas the speculative read request is validated if it is received before a write request [column 4, lines 50-58]. There is no suggestion of performing speculative writes of the next directory state for the data block. Arimilli clearly teaches that the directory of an L2 cache is not updated until after the speculation has been validated [note box 43 of Figure 3]. Thus, we disagree with the examiner's position that Arimilli teaches a speculative write of the next directory state as recited in the claimed invention.

Since all the remaining claims on appeal contain recitations similar to the recitations of claims 1, 3, 5, 7 and 10, we also do not sustain the examiner's rejection of any of these remaining claims on appeal. Therefore, the decision of the examiner rejecting claims 1-16 is reversed.

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REVERSED

JERRY SMITH)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
JOSEPH L. DIXON)	APPEALS
Administrative Patent Judge)	AND INTERFERENCES
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)	
MAHSHID D. SAADAT)	
Administrative Patent Judge)	

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HEWLETT PACKARD COMPANY
P. O. BOX 272400
3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400