

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID L. RHODES

Appeal No. 2003-0333
Application 09/231,041

ON BRIEF

Before JERRY SMITH, FLEMING, 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 1-3 and 5-8, which constitute all the claims remaining in the application.

The disclosed invention pertains to an improved cache memory system for a computer.

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Representative claim 1 is reproduced as follows:

1. In a computer system of the type wherein a processor directs information to and retrieves information from a memory which includes main memory and cache memory, the improvement comprising:

a plurality of separate and independent memory branches extend from a common bus that passes at a hierarchical level immediately above the processor and a combination of main memory and cache memory is included in each branch, with at least one branch having at least one hierarchical level of multiple cache memory units in a memory space division.

The examiner relies on the following references:

Menasce	5,193,166	Mar. 09, 1993
Mattson	5,434,992	July 18, 1995
Smith	5,696,932	Dec. 09, 1997

Handy, Jim, The Cache Memory Book (New York, Academic Press, Inc., 1933), pages 87-91.

The following rejections are on appeal before us:

1. Claims 1 and 2 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Menasce in view of Smith.

2. Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Menasce in view of Smith and further in view of Handy.

3. Claims 5 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Menasce in view of Smith and further in view of Mattson.

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4. Claims 7 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Menasce in view of Smith and further in view of Handy and Mattson.

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

OPINION

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

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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 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

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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, 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 appellant have been considered in this decision. Arguments which appellant could have made but chose not to make in the brief have not been considered and are deemed to be waived by appellant [see 37 CFR § 1.192(a)].

We consider first the rejection of sole independent claim 1 based on the teachings of Menasce and Smith. The examiner indicates that Menasce teaches the invention of claim 1 except that Menasce does not specifically disclose at least one branch having at least one hierarchical level of multiple cache memory units in a memory space division. The examiner asserts that the teachings of Menasce can be extended and applied to each branch of Menasce to arrive at the claimed invention. The examiner also cites Smith as teaching a hierarchical level of multiple cache memory units in a memory space division. The examiner finds that it would have been obvious to the artisan to modify Menasce as taught by Smith to arrive at the claimed invention [answer, pages 3-4].

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Appellant argues that the portion of Menasce relied on by the examiner fails to support the examiner's position that the branches in Menasce are separate and independent as claimed. Appellant argues that the branches in Menasce are clearly interleaved and, therefore, not independent. Appellant also argues that any memory space division in Menasce occurs in separate branches rather than in an individual branch as claimed. Appellant also argues that Smith relates only to dividing a cache into a plurality of partitions and not to a memory space division as claimed [brief, pages 4-8].

The examiner responds by essentially repeating the language of the final rejection. The examiner disagrees with appellant that the branches in Menasce are not independent. As noted above, the examiner simply asserts that the teachings of Menasce can be extended to arrive at the claimed invention or that Smith teaches the memory space division as claimed [answer, pages 8-10].

Appellant responds that the interleaving in Menasce and the teaching that the CMMUs for each word may be paralleled require that the branches be interdependent. Appellant complains that the examiner failed to address this argument. Appellant also argues that there is no support for the examiner's position

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that the teachings in Menasce can be extended to arrive at the claimed invention. Appellant also responds that Smith relates only to dividing a cumulative cache memory into a plurality of partitions and not to a memory space division as claimed [reply brief, pages 3-8].

We will not sustain the examiner's rejection of claim 1 based on this record. With respect to the question of whether the branches in Menasce are separate and independent, we are not persuaded by appellant's arguments that these branches are interdependent as argued by appellant. Although Menasce states that the CMMUs are interleaved rather than the data or code words, we understand from the drawings that it is the access of the CMMUs that is interleaved rather than the CMMUs per se. In other words, the data storage and retrieval within each branch appears to be separate and independent to us. Nevertheless, we agree with appellant that neither Menasce nor Smith teaches the claim recitation of at least one branch having at least one hierarchical level of multiple cache memory units in a memory space division. The examiner's position that Menasce can be extended to arrive at the claimed invention is unsupported by Menasce. Although Menasce teaches that bandwidth is improved by going from the structure of Figure 1 to the structure of Figure

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2, the extension proposed by the examiner is not of the same type as that structural change, and there is no suggestion that the proposed extension would result in any benefit whatsoever. We also agree with appellant that Smith has nothing to do with a memory space division at one hierarchical level. As noted by appellant, a memory space division requires a structural separation between the memories. Smith simply partitions a single cache memory and does not relate to a memory space division within a hierarchical level of cache memories.

For all the reasons discussed above, we have not sustained the examiner's rejection of independent claim 1 based on Menasce and Smith. Since Hardy and Mattson, either alone or in combination, do not overcome the deficiencies of the base combination discussed above, we also do not sustain the

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examiner's rejection of any of the dependent claims. Therefore,
the decision of the examiner rejecting claims 1-3 and 5-8 is
reversed.

REVERSED

JERRY SMITH)	
Administrative Patent Judge)	
)	
)	
)	BOARD OF PATENT
MICHAEL R. FLEMING)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
)	
)	
MAHSHID D. SAADAT)	
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