

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JENS BARRENSCHEEN and KARL HERZ

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Appeal 2007-1738  
Application 10/116,173  
Technology Center 2100

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Decided: November 16, 2007

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*Before:* JOHN C. MARTIN, ALLEN R. MACDONALD,  
and MARC S. HOFF, *Administrative Patent Judges.*

MACDONALD, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF CASE

Appellants appeal under 35 U.S.C. § 134 from a Final Rejection of claims 1-20. We have jurisdiction under 35 U.S.C. § 6(b).

THE INVENTION

Appellants invented a program-controlled unit and method in which (1) a memory management device receives data from a central processing

unit (CPU) and writes the data into memory or (2) the memory management device receives data from the memory and transfers the data to the CPU.

(Spec. 3:18-25).

Claim 1 is exemplary:

1. A program-controlled unit, comprising:

a CPU;

a memory device;

a memory management device connected to said CPU and directly to said memory device, said memory management device at an instigation of said CPU, one of writes data output by said CPU to said memory device and reads out the data stored in said memory device and forwards the data to said CPU; and

a control device connected to said memory management device, said control device outputting control signals for prescribing at least in part instants at which said memory management device has to perform actions required for carrying out a data transfer.

#### THE REFERENCES

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Crandall                      US 6,701,028 B1                      Mar. 2, 2004

Lopez                         EP 0 911 735 A2                      Apr. 28, 1999

#### REJECTIONS AT ISSUE

Claims 1-13, 16, 17, 19, and 20 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Crandall.

Claims 14, 15, and 18 stand rejected under 35 U.S.C. § 103(a) as obvious over the combined teachings and suggestions of Crandall and Lopez.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the Briefs and the Answer for their respective details. 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 Briefs have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2004).

We reverse and enter a new ground of rejection.

#### ISSUES

Have Appellants shown that the Examiner erred in finding that claims 1-13, 16, 17, 19, and 20 are anticipated by Crandall?

Have Appellants shown that the Examiner erred in finding that claims 14, 15, and 18 are obvious over the combined teachings and suggestions of Crandall and Lopez?

### FINDINGS OF FACT

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

#### *Crandall*

1. Crandall teaches a digital signal processor (DSP) that includes a program control unit (PCU) 32, an arithmetic computation unit (ACU) 34, a memory management unit 36, and a data memory 38. (Col. 21, ll. 7-15 and FIG. 7).
2. Crandall teaches that PCU 32 transfers control bits to memory management unit 36. (Col. 21, ll. 29-33). In response to the control bits, memory management unit 36 generates and transfers address signals to memory 38. (Col. 21, ll. 25-29). The address signals identify a memory location in memory 38 where data is to be written or a memory location from which data is to be read. (*Id.*).
3. Crandall teaches that memory 38 responds to receipt of address signals by sending data to ACU 34 and that ACU 34 processes data and transfers the processed data to memory 38 for writing into memory 38. (Col. 21, ll. 34-42).
4. Crandall does not teach controlling the exact times of reads from memory 38 or writes into memory 38.

*Lopez*

5. Lopez teaches use of FLASH memory 208 and instruction overlay memory 214 (col. 7, ll. 5-7) but Lopez does not teach controlling the exact times of reads from memory or writes into memory.

*Bechtolsheim*

6. U.S. Patent 4,550,368 (Bechtolsheim) discloses a system having a central processing unit (CPU), memory management unit (MMU) 18, timing generator 43, and main memory 28. (Col. 3, l. 63-Col. 4, l. 22 and FIG. 1).
7. Bechtolsheim discloses that the CPU transfers data to MMU 18 and that MMU 18 writes the data into main memory 28. (Col. 3, l. 63-Col. 4, l. 19). Bechtolsheim discloses that the CPU initiates transfer of data via MMU 18 into memory 28 by use of a write control line 26. (Col. 4, ll. 11-14).
8. Bechtolsheim discloses that MMU 18 transfers data to the CPU via driver 33, line 32, and data bus 22. (Col. 3, ll. 63-65 and Col. 4, ll. 7-9).
9. Bechtolsheim discloses that timing generator 43 controls transfer of data from MMU 18 into memory 28 through line 38 from MMU 18 by enabling driver 39 through assertion of line 41 and by providing row and column address strobes via line 52 to memory 28. (Col. 4, ll. 16-22). Bechtolsheim discloses that timing generator 43 transmits timing pulses to strobe row and column addresses to main memory to allow access of desired storage locations. (Col. 5, ll. 26-30).

## 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)

Anticipation is established when a single prior art reference discloses expressly or under the principles of inherency each and every limitation of the claimed invention. *Atlas Powder Co. v. IRECO Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999); *In re Paulsen*, 30 F.3d 1475, 1478-79 (Fed. Cir. 1994).

"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 subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007) (quoting 35 U.S.C. § 103(a)). 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, and (3) the level of skill in the art. *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.").

ANALYSIS

*35 U.S.C. § 102(e)*

We find that the Examiner erred in rejecting claims 1-13, 16, 17, 19, and 20 as being anticipated by Crandall.

In pertinent part, claim 1 recites “memory management device . . . one of writes data . . . to said memory device and reads out the data stored in said memory device . . . outputting control signals for prescribing at least in part instants at which said memory management device has to perform actions required for carrying out a data transfer.” In claim 1, the term “data transfer” is used after claim 1 states that the memory management device writes data into the memory device or reads data out of the memory device. Accordingly, we interpret “data transfer” to encompass writing data into the memory device or reading data from the memory device.

We find that Crandall does not teach prescribing instants at which a memory management device reads from a memory or writes into a memory. (FF 4). We acknowledge that Appellants have alleged that Crandall does not teach that the memory management device does not write data from CPU into memory or transfer data read from memory to the CPU (App. Br. 9-11 and Reply Br. 5-7). However, in deciding that the Examiner has erred in rejecting claim 1 as being anticipated by Crandall, we rely solely on our finding that Crandall does not teach prescribing instants at which a memory management device reads from a memory or writes into a memory. Accordingly, we determine that the Appellants have met their burden of showing that the Examiner has erred in rejecting claim 1 as anticipated by Crandall.

Claims 2-13 and 16 depend from claim 1 and include the same limitations as claim 1. Because Crandall does not disclose prescribing instants at which a memory management device reads from a memory or writes into a memory, we determine that the Appellants have met their burden of showing that the Examiner has erred in rejecting claims 2-13 and 16 as anticipated by Crandall.

Claim 17 recites “memory management device . . . writing data . . . to the memory device or reading out the data stored in the memory device . . . prescribing time instants at which the memory management device performs actions required for carrying out a data *transfer from* one of the memory devices *to the CPU*” (emphasis added). Because an earlier portion of claim 17 states that memory management device reads out data from a memory device, we interpret “data transfer from one of the memory devices to the CPU” to encompass a memory read operation. We find that Crandall does not teach prescribing instants at which a memory management device reads from a memory. (FF 4). Accordingly, we determine that Appellants have met their burden of showing that the Examiner has erred in rejecting claim 17 as anticipated by Crandall.

Claim 20 depends from claim 17 and includes the same limitations as claim 17. Because Crandall does not disclose prescribing instants at which a memory management device reads from a memory, we determine that the Appellants have met their burden of showing that the Examiner has erred in rejecting claim 20 as anticipated by Crandall.

*35 U.S.C. § 103(a)*

We find that the Examiner erred in rejecting claims 14, 15, and 18 as being obvious over the combined teachings and suggestions of Crandall and Lopez.

Claims 14 and 15 depend from claim 1. Lopez does not teach or suggest prescribing instants at which a memory management device reads from a memory or writes into a memory. (FF 5). Accordingly, Appellants have met their burden of showing that the Examiner has erred in rejecting claims 14 and 15 as obvious over the combined teachings and suggestions of Crandall and Lopez.

Claim 18 depends from claim 17. Lopez does not teach or suggest prescribing instants at which a memory management device reads from a memory. (FF 5). Accordingly, Appellants have met their burden of showing that the Examiner has erred in rejecting claim 18 as obvious over the combined teachings and suggestions of Crandall and Lopez.

NEW GROUND OF REJECTION

Our decision relies on a new patent reference and new reasoning. Due to application of the new patent reference and new reasoning, we designate our decision as a new ground of rejection.

*35 U.S.C. § 102(b)*

We reject claim 1 under 35 U.S.C. § 102(b) as being anticipated by Bechtolsheim, using our authority under 37 C.F.R. § 41.50(b). Claim 1 requires a CPU, memory device, memory management device, and control

device and Bechtolsheim discloses all such elements as respective CPU, main memory 28, MMU 18, and timing generator 43 (FF 6). Claim 1 requires that the memory management device is connected to the CPU and the memory device and Bechtolsheim discloses all such elements (FF 7).

Claim 1 recites that “memory management device at an instigation of said CPU, *one of* writes data output by said CPU to said memory device and reads out the data stored in said memory device and forwards the data to said CPU” (emphasis added). We find that the cited portion of claim 1 merely requires one of a write into a memory device *or* a read from the memory device but not both. Bechtolsheim discloses that the CPU transfers data to the MMU and, at the initiation by the CPU, the MMU transfers the data to the memory. (FF 7). Accordingly, we find that Bechtolsheim discloses “memory management device at an instigation of said CPU, one of writes data output by said CPU to said memory device and reads out the data stored in said memory device and forwards the data to said CPU.”

Claim 1 also recites “a control device connected to said memory management device, said control device outputting control signals for prescribing at least in part instants at which said memory management device has to perform actions required for carrying out a data transfer.” Regarding connection of control device to memory management device, Bechtolsheim discloses that timing generator 43 issues control signals to the driver 39 that is coupled to line 38 from MMU 18. (FF 9). Accordingly, timing generator 43 is connected to MMU 18 by virtue of its connection to line 38 through driver 39.

We next address the requirement that the control device prescribe instants for carrying out a data transfer. For reasons supplied *supra*, we interpret the “data transfer” to refer to either a data write or data read. Bechtolsheim discloses that timing generator 43 issues control signals that control when a data write into main memory 28 takes place. (FF 9). Accordingly, we find that Bechtolsheim discloses “a control device connected to said memory management device, said control device outputting control signals for prescribing at least in part instants at which said memory management device has to perform actions required for carrying out a data transfer.”

Accordingly, we find that claim 1 is anticipated by Bechtolsheim under 35 U.S.C. § 102(b).

*37 C.F.R. § 41.50(b)*

37 C.F.R. § 41.50(b) provides that, “[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.”

37 C.F.R. § 41.50(b) also provides that the Appellants, *WITHIN TWO MONTHS FROM THE DATE OF THE DECISION*, must exercise one of the following two options with respect to the new grounds of rejection to avoid termination of appeal as to the rejected claims:

- (1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner ...
- (2) *Request rehearing*. Request that the proceeding be reheard under 37 C.F.R. § 41.52 by the Board upon the same record ...

### OTHER ISSUES

The Board of Patent Appeals and Interferences is a review body, rather than a place of initial examination. We have made a rejection above under 37 C.F.R. § 41.50(b). However, we have not reviewed claims 2-20 to the extent necessary to determine whether these claims are patentable over the disclosure of Bechtolsheim alone or in combination with one or more other references. We leave it to the Examiner to determine the appropriateness of any further rejections based on this reference.

Should there be further prosecution, we request that the Examiner determine whether claims 6, 10, 11, and 13 comply with the definiteness requirement of 35 U.S.C. § 112, second paragraph and review the claims to ensure that they are written in correct grammar.

### CONCLUSION OF LAW

(1) Appellants have shown that the Examiner erred in finding that claims 1-13, 16, 17, 19, and 20 are anticipated by Crandall under 35 U.S.C. § 102(e).

(2) Appellants have shown that the Examiner erred in concluding that claims 14, 15, and 18 are obvious over the combined teachings and suggestions of Crandall and Lopez under 35 U.S.C. § 103(a).

(3) Claim 1 is anticipated by Bechtolsheim under 35 U.S.C. § 102(b).

(4) On this record, claims 2-20 have not been shown to be unpatentable.

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DECISION

The Examiner's rejection of claims 1-13, 16, 17, 19, and 20 under 35 U.S.C. § 102(e) is reversed.

The Examiner's rejection of claims 14, 15, and 18 under 35 U.S.C. § 103(a) is reversed.

Claim 1 is rejected under 35 U.S.C. § 102(b) as being anticipated by Bechtolsheim.

A new ground of rejection has been entered under 37 C.F.R. § 41.50(b).

REVERSED  
37 C.F.R. § 41.50(b)

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