Paper No. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHAEL T. WISOR

Appeal No. 2002-1319
Application No. 08/974,971

ON BRIEF

Before BARRETT, BARRY, and LEVY, Administrative Patent Judges.
LEVY, Administrative Patent Judge.

## DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 23-48, which are all of the claims pending in this application.

## BACKGROUND

Appellant's invention relates to a non-volatile memory system having a programmably selectable boot code section. An understanding of the invention can be derived from a reading of exemplary claim 23, which is reproduced as follows:

23. A non-volatile memory device, comprising:

a memory array comprising a plurality of memory blocks, wherein a boot code section of the memory array is configured to store boot code;

a storage unit, wherein a portion of the storage unit is configured to store information indicating a size of the boot code section; and

a control unit configured to control storage of data within and retrieval of date from the memory array, wherein the control unit is further configured to vary the size of the boot code section by modifying the information indicating the size of the boot code section.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

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| Maher et al. (Maher) | 5,375,209 | Dec. 20, 1994 |
| Boehmer et al. (Boehmer) | 5,892,927 | Apr. 6, 1999 (filed Jan. 8, 1997) |
| Oh | 5,961,611 | Oct. 5, 1999 (filed May 30, 1997) |
| DeRoo et al. (DeRoo) | 6,009,495 | Dec. 28, 1999 (filed Nov. 8, 1995) |

Claims 23-28 and 30-41 stand rejected under 35 U.S.C. § 102(e) as being anticipated by DeRoo.

Claims 23-41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over DeRoo in view of either Oh or Boehmer.

Claims 42-48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Maher in view of DeRoo and either Oh or Boehmer.

Rather than reiterate the conflicting viewpoints advanced by the examiner and appellant regarding the above-noted rejections, we make reference to the examiner's answer (Paper No. 19, mailed October 2, 2001) for the examiner's complete reasoning in support of the rejections, and to appellant's brief (Paper No. 18, filed July 16, 2001) and reply brief (Paper No. 20, filed November 27, 2001) for appellant's arguments thereagainst. 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. See 37 CFR 1.192(a).

## OPINION

In reaching our decision in this appeal, we have carefully considered the subject matter on appeal, the rejections advanced by the examiner, and the evidence of anticipation and obviousness relied upon by the examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, 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.

Upon consideration of the record before us, we affirm-in-part. We begin with the rejection of claims 23-28 and 30-41 under 35 U.S.C. § 102(e) as being anticipated by DeRoo.

To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently. In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997).

We turn to claim 23. The examiner sets forth reasons (answer, pages 4-6) as to why the examiner considers claim 23 to be anticipated by DeRoo. Appellant assert (brief, page 6) that DeRoo fails to disclose a non-volatile memory device where a boot code section of the memory array is configured to store boot code, as recited in claim 23, because common memory device 704 does not have built in boot block protection. Instead, DeRoo uses a separate device (HUI 700) to "emulate boot block protection." Appellant further argues (id.) that HUI 700 is not "a control unit configured to control storage of data within and retrieval of data from the memory array, wherein the control unit is further configured to vary the size of the boot code section

by modifying the information indicating the size of the boot code section," as recited in independent claim 23. Appellant additionally asserts (brief, pages 6 and 7) that DeRoo teaches that the boot block size is configured in hardware with either pull-up or pull-down resistors, and that since HUI 700 is hardware strapped, it does not allow software reconfiguration of the protected memory; i.e., that the software is disabled from writing to define non-volatile sectors. Appellant asserts (brief, page 7) that "[t]hus, DeRoo clearly does not disclose a control unit that is configured to vary the size of the boot code section by modifying information indicating the size of the boot code section."

We begin our analysis with a determination of claim construction. Analysis of whether a claim is patentable over the prior art begins with a determination of the scope of the claim. The properly interpreted claim must then be compared with the prior art. Claim interpretation must begin with the language of the claim itself. See Smithkline Diagnostics, Inc. v. Helena Laboratories Corp., 859 F.2d 878, 882, 8 USPQ2d 1468, 1472 (Fed. Cir. 1988). Accordingly, we will initially direct our attention to appellant's claim 23 to derive an understanding of the scope and content thereof.

Before turning to the proper construction of the claim, it is important to review some basic principles of claim construction. First, and most important, the language of the claim defines the scope of the protected invention. Yale Lock Mfg. Co. v. Greenleaf, 117 U.S. 554, 559 (1886) ("The scope of letters patent must be limited to the invention covered by the claim, and while the claim may be illustrated it cannot be enlarged by language used in other parts of the specification."); Autogiro Co. of Am. v. United States, 384 F.2d 391, 396, 155 USPQ 697, 701 (Ct. Cl. 1967) ("Courts can neither broaden nor narrow the claims to give the patentee something different than what he has set forth [in the claim]."). See also Continental Paper Bag Co. v. Eastern Paper Bag Co., 210 U.S. 405, 419 (1908); Cimiotti Unhairing Co. v. American Furuya Ref. Co., 198 U.S. 399, 410 (1905).

Furthermore, the general claim construction principle that limitations found only in the specification of a patent or patent application should not be imported or read into a claim must be followed. See In re Priest, 582 F.2d 33, 37, 199 USPQ 11, 15 (CCPA 1978). One must be careful not to confuse impermissible imputing of limitations from the specification into a claim with the proper reference to the specification to determine the

meaning of a particular word or phrase recited in a claim. See E.I. Du Pont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 1433, 7 USPQ2d 1129, 1131 (Fed. Cir.), cert. denied, 488 U.S. 986 (1988).

What we are dealing with in this case is the construction of the limitations recited in the appealed claims. As stated by the court in In re Hiniker Co., 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998) "[t]he name of the game is the claim." Claims will be given their broadest reasonable interpretation consistent with the specification, and limitations appearing in the specification are not to be read into the claims. In re Etter, 756 F.2d 852, 858, 225 USPQ 1, 5 (Fed. Cir. 1985).

We find that the claim language "wherein the control unit is further configured to vary the size of the boot code section by modifying the information indicating the size of the boot code section" of claim 23 is not specific as to whether software or hardware is used to vary the size of the boot code section. Nor does the language of the claim preclude the varying of the size of the boot code through the use of hardware. Nor does the claim preclude the use of hardware for modifying the information indicating the size of the boot code section. With this interpretation of the claim in mind, we turn to the teachings of

DeRoo. DeRoo discloses (col. 2, lines 10-16) that the invention relates to providing non-volatile memory sectors in conventional memory devices. Specifically, DeRoo is directed to providing non-volatile "boot block" sectors in an EEPROM. From this disclosure of DeRoo, we find that DeRoo discloses providing boot block sectors in a non-volatile EEPROM memory.

DeRoo further discloses (col. 2, lines 57-60) that boot block sectored EEPROMS are also referred to as flash ROMS. DeRoo recognizes (col. 2, lines 65-57) that these devices typically have a predefined protected memory area size, which limits their flexibility in some applications. It is an object of the invention (col. 3, lines 20-22) that the size of the non-volatile sectors be selectable and automatically programmed at power on. In addition, in an embodiment where the system reset is deasserted immediately after power on, the size of the protected EEPROM area is sensed on special strapping option pins and automatically configures the non-volatile sector. "This allows the size of the protected area to be changed on the manufacturing line as needed for different applications. Once configured to protect a specific size and location in the non-volatile memory, the invention prevents the write control signal to the memory to be asserted when the address of the data access requested by the

CPU is in the protected area of the memory. This has the effect of preventing modification of the protected area by a sector modification algorithm." (Col. 3, lines 31-40.) From these disclosures of DeRoo, we find that the size of the protected area can be changed on the manufacturing line as needed, but that once configured to protect a specific size and location in the non-volatile memory, modification of the protected area by a sector modification algorithm is prevented.

DeRoo further discloses (col. 76, Table LXVIII) under the title of "HUI[1] HARDWARE CONFIGURATION STRAPS REGISTER 1" a listing of various boot block sizes ranging from 2K to 32K. DeRoo further discloses (col. 87, lines 18-44) that:

> The HUI 700 provides non-volatile sector protection allowing a standard electrically erasable programmable read-only memory (EEPROM) to be used as the common memory device 704 and utilized as a functional equivalent to a protected "boot block" memory device. In effect, the HUI 700 acts as front-end to the common memory device 704. As such, it captures protected address ranges to block data writes. And, since the HUI 700 is hardware strapped, it does not allow software reconfiguration of memory protection. Thus, as described below, where the programmable memory provides for global erasure, the HUI 700 front-end hardware traps the command, rendering it inoperable. Moreover, the software is completely disabled from writing to define non-volatile sectors.

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[1] Human User Interface.

> In particular, the memory address bus FA[0:17] is compared in a boot block protect decoder 2050 (FIGS. 25 and 26), part of the control logic 720, with a predetermined address range forming the protected boot block. The boot block size bit HUICFG_1[0:3] and flash size bit HUICFG_1[7] may be specified in a configuration register HUICFG_1[0:17] to define the non-volatile sector. In order to block writes to the protected sector, the output of the comparator 2052 is ORED by way of an OR gate 2054 with a write enable signal WE to create a non-volatile sector.

From this disclosure of DeRoo, we find that HUI 700 provides a non-volatile sector protection for an EEPROM to be used as the common memory device (See figure 20), and that since HUI 700 is hardware strapped, it does not allow software reconfiguration of memory protection. Thus, the software is disabled from writing to define non-volatile sectors. Memory address bus FA[0:17] is compared in a boot block protection decoder 2050 (figures 25 and 26) with a predetermined address range forming the protected boot block. We further find that the boot block size bit HUICFG_[0:3] may be specified in a configuration register HUICFG_1[0:17] to define the non-volatile sector (see figure 25).

DeRoo further discloses (col. 87, lines 46-49) that various sector sizes are possible as illustrated in Table LXVIII, and that several of the bits in the HUICFG_1[0:3,7] may be configured

in hardware with either pull-up or pull-down resistors (not shown) to provide any of the sizes shown in Table LXVIII. From this disclosure of DeRoo, we find that sizes of the boot block sector are configured in hardware using pull-up or pull-down resistors.

DeRoo further discloses (col. 88, lines 1-5) that "[t]hus, as described, the HUI 700 can be configured to emulate boot block protection to enable memory device such as the common memory device 704 which do not have built-in boot block protection capability to be used for storage of the boot block protected code non-volatile sector." Although DeRoo discloses that memory 704 does not have built-in boot block protection, and that HUI 700 emulates boot block protection, we find from all of the teachings of DeRoo provides boot block protection, irrespective of whether it is emulated. Moreover, DeRoo discloses (col. 88, lines 10-15) that the protected boot block range should start on a 1 kilobyte memory boundary and finish at the top of the memory as shown in figure 27. The size, as defined in Table LXVIII, and therefore the starting address of the protected range, can be determined from the hardware configuration register HUICFG_[0:7]. The remaining memory space is used for SCP (system control processor) non-volatile areas and BIOS.

From this disclosure of DeRoo, we find that the protected boot block size should start at the 1K memory boundary and finish at the top of the memory boundary.

DeRoo further discloses (col. 92, lines 15-30) that the protection of the critical information can be turned on or off, by latching the value of pin 6 of HUI 700, to allow a system designer to elect to use the present invention or not without changing the design of the HUI 700 and preventing the software control of this feature. DeRoo additionally discloses (col. 100, lines 47-50) "means for programmably disabling said preventing means, said disabling means including means for allowing reads and writes to said protected address range in said memory device." Similar language can be found in col. 101, lines 29-31; col. 103, lines 1-3; and col. 104, lines 4-7 and 35-37. From these disclosures of DeRoo, we find that the protection of the protected address range may be disabled, allowing for writing to the protected address.

Turning back to claim 23, we find that the HUI 700 of DeRoo is configured to vary the size of the boot code section by modifying the information indicating the size of the boot code section; i.e., if the boot block range starts at the 1K memory boundary, and the user selects an 8K boot block size from the

hardware configuration register 1 shown in Table LXVIII, the boot block will take up the top 8K of space in memory 704. Although the size of the boot block space will be configured in hardware, it is still set by the user. Whether this is the size of the protected area to be changed on the manufacturing line as needed for different applications, or whether it is a change in size of the boot block after disabling of the preventing means which protects the non-volatile memory, in either instance, the language "wherein the control unit is further configured to vary the size of the boot code section by modifying the information indicating the size of the boot code section" as recited in claim 23," is met by DeRoo. Although DeRoo discloses (col. 100, lines 65-67) that the boot block size is defined by hardware, claim 23 does not recite that the control unit is configured by software to vary the size of the boot code section.

We are not persuaded by appellant's assertion that "[t]hus, DeRoo clearly does not disclose a control unit the is configured to vary the size of the boot code section by modifying information indicating the size of the boot code section" because the information regarding the boot code size, whether it is from the 1K boundary or whether it is a selected configuration that is changed upon disabling of the prevention means, the information

indicating the size of the boot code section is modified. Because DeRoo discloses that the memory address bus FA[0:17] is compared with a predetermined address range forming the protected boot block (col. 87, lines 34-37), we find that the size of the boot code section is stored by DeRoo. In addition, because DeRoo discloses (col. 87, lines 37-40) that the boot block size bit may be specified in a configuration register, we additionally find that the size of the boot code section is stored.

Nor are we persuaded by appellant's assertion (brief, page 7) that "[t]he Examiner contends that DeRoo nevertheless anticipates the claimed invention if the Examiner includes the mechanism used by DeRoo to modify the contents of the HUICFG_1 register to read on the claimed 'control unit.' However, the DeRoo mechanism cannot be construed to read upon the claimed control unit since the DeRoo mechanism is not part of the memory device . . . " because HUI 700 acts as front-end to the common memory device 704 (col. 87, lines 22-24).

We find the examiner's assertion (answer, page 6) that "the person or machine that would have been necessary to modify the content of the HUICFG_1 register would have met the limitation of the claim when the said person or machine is considered part of the claimed 'control unit'" to be misstated, and consider the

examiner's position to be that in the operation of HUI 700 of DeRoo, the size of the boot code section is varied.

From all of the above, we find that DeRoo anticipates claim 23. Accordingly, the rejection of claim 23 under 35 U.S.C. § 102(e) is affirmed. As claims 24-28 and 30-41 stand or fall together (brief, page 5) the rejection of claims 24-28 and 30-41 under 35 U.S.C. § 102(e) is affirmed.

We turn next to the rejection of claims 23-41 under 35 U.S.C. § 103(a) as being unpatentable over DeRoo in view of either Oh or Boehmer. We begin with claims 23-28 and 30-41 as claim 29 was not rejected under 35 U.S.C. § 102(e), supra, and has been separately argued. As we found, supra, that claim 23 is anticipated by DeRoo, we similarly find that claim 23 would have obvious over DeRoo in view of Oh or Boehmer, as anticipation is the epitome of obviousness. The Board may rely on one reference alone in an obviousness rational without designating it as a new ground of rejection. In re Bush, 296 F.2d 491, 496, 131 USPQ 263, 266-67 (CCPA 1961); In re Boyer, 363 F.2d 455, 458 n.2, 150 USPQ 441, 444 n.2 (CCPA 1966). Lack of novelty is the ultimate of obviousness. See In re Fracalossi, 681 F.2d 792, 794, 215 USPQ 569, 571 (CCPA 1982). Accordingly, we find the reference to Oh and Boehmer to be cumulative to DeRoo, and affirm the

rejection of claims 23-28 and 30-41 under 35 U.S.C. § 103(a) as being unpatentable over DeRoo in view of either of Oh or Boehmer.

We turn next to claim 29. The examiner's position is that the references render the claims obvious and relies upon a Doctrine of Equivalents analysis based upon the known interchange ability between a jumper-based approach and a software approach of configuring digital equipment (answer, page 7). The examiner relies upon Boehmer for a teaching that a register may be reprogrammed by the user by the use of jumpers or through software. The examiner additionally relies upon OH for a teaching of setting options in a configuration control register, instead of the hardware jumper method, by means of a software program (answer, pages 7 and 8). In the examiner's opinion, it would have been obvious to use commands for the purpose of modifying the contents of the HUICFG_1 register. Appellant's assert (brief, page 11) that the prior art does not teach or suggest that the control unit is configured to modify the information in response to receiving a predeterminer sequence of bus write cycles. We agree. As we found, supra, DeRoo teaches modifying the boot code section information through the use of hardware, using pull-up and pull-down resistors. We find no teaching or suggestion in DeRoo, and none has been pointed to by

the examiner, that would teach or suggest using a predetermined sequence of write cycles to modify the size of the boot block code section. We find that although Oh and Boehmer disclose the interchange ability of using hardware and software for changing options in a reconfiguration register (Boehmer) or a delay compensation register (OH), that because DeRoo is directed to a hardware-based approach to prevent reconfiguring the memory with software, we agree with appellant (brief, page 11) that "DeRoo purposefully uses the hardware-based approach so that the memory cannot be reconfigured by software. Thus, DeRoo explicitly teaches away from the Examiner's proposed modification. Modifying DeRoo to use a software-based approach would clearly undermine DeRoo's express purpose of preventing software reconfiguration of the memory." Accordingly, we find that the examiner has failed to establish a prima facie case of obviousness of claim 29. The rejection of claim 29 under 35 U.S.C. § 103(a) is therefore reversed.

We turn next to the rejection of claims 42-48 under 35 U.S.C. § 103(a) as unpatentable over Maher in view of DeRoo, and further in view of Oh or Boehmer. We begin with claim 42. We reverse the rejection of claim 42 for the following reasons. Maher is relied upon to show the CPU, expansion bus adapter,

video and disk controllers, memory bus and chip set logic. The combined teachings of Maher, DeRoo, Oh, and Boehmer fail to teach or suggest varying the size of the boot code section by modifying the information stored in the boot section size field in response to signals on the memory bus. As we found, supra, with respect to claim 29, the combined teachings of DeRoo, Oh and Boehmer do not teach or suggest that the size of the boot code section may be modified in response to signals on the memory bus, but rather is modified using the pull-up and pull-down resistors. Accordingly, we find that the examiner has failed to establish a prima facie case of obviousness of claim 42. The rejection of claim 42, and claims 43-48, dependent therefrom, under 35 U.S.C. § 103(a) is therefore reversed.

CONCLUSION

To summarize, the decision of the examiner to reject claims 23-28 and 30-41 under 35 U.S.C. § 102(e) is affirmed. The decision of the examiner to reject claims 23-28 and 30-41 under 35 U.S.C. § 103(a) is affirmed. The decision of the examiner to reject claims 29 and 42-48 under 35 U.S.C. § 103(a) is reversed.

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

AFFIRMED-IN-PART

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| LEE E. BARRETT<br>Administrative Patent Judge | ) | |
| LANCE LEONARD BARRY<br>Administrative Patent Judge | ) | BOARD OF PATENT APPEALS AND INTERFERENCES |
| STUART S. LEVY<br>Administrative Patent Judge | ) | |

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