

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* BRADLEY RYAN HARRINGTON, STEPHEN DALE LINAM,  
and VIKRAMJIT SETHI

Appeal 2008-0861  
Application 10/411,465<sup>1</sup>  
Technology Center 2100

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Decided: October 20, 2008

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Before JAMES D. THOMAS, ALLEN R. MACDONALD,  
and JEAN R. HOMERE, *Administrative Patent Judges*.

HOMERE, *Administrative Patent Judge*.

DECISION ON APPEAL

I. STATEMENT OF CASE

Appellants appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1 through 14, and 16 through 21. Claim 15 has been canceled. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

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<sup>1</sup> Filed on Apr. 10, 2003. The real party in interest is IBM, Corp.

Appellants invented a method and system for managing partition firmware in a logical partitioned data processing system. (Spec. 1.) As depicted in Figure 2, the data processing system (100) includes a single logical partitioned platform (200) upon which multiple operating systems (OS) (202, 204, 206, 208) are simultaneously run. (Spec. 6.) Each of the logical partitions (203, 205, 207, 209) includes one of the OS that operates with a partition firmware (211, 213, 215, 217) such that the OS may access only those I/O units within its logical partition. (Spec. 7.) As shown in Figure 3, the partition firmware is implemented as two separately loadable modules (302, 316) or load identifiers (LIDS). (Spec. 14.) In a first runtime, a hypervisor (210) loads the first module (302) into memory such that the module provides an interface for receiving calls from the OS in the partition. (Spec. 15-16.) In a second runtime, an LID loader function (310) in the first module (302) is used to load the second module (316) into memory to execute the calls received from the first module. (*Id.*)

Independent claim 1 further illustrates the invention. It reads as follows:

1. A method for managing partition firmware in a logical partitioned data processing system, the method comprising:

loading a first module in the partition firmware, wherein the partition firmware resides in a partition within a set of partitions, and wherein the first module provides an interface for receiving calls from an operating system in the partition;

Appeal 2008-0861  
Application 10/411,465

loading a second module in the partition firmware wherein the second module is loaded by the first module and wherein the second module provides a plurality of functions; and

routing calls received at the interface of the first module to the second module, wherein the second module executes functions in response to the calls.

The Examiner relies on the following prior art:

Goldberg	US 4,607,332	Aug. 19, 1986
Mealey	US 5,918,048	Jun. 29, 1999
Bouchier	US 6,725,317 B1	Apr. 20, 2004
Lilja	US 6,789,157 B1	Sep. 7, 2004
Natu	US 6,910,113 B2	Jun. 21, 2005

The Examiner rejects the claims on appeal as follows:

A. Claims 1 through 3, 7 through 10, 14, and 16 through 18 stand rejected under 35 U.S.C. § 103 (a) as being unpatentable over the combination of Lilja, Bouchier, Natu, and Mealey.

B. Claims 4 through 6, 11 through 13, 14, 19, and 20 stand rejected under 35 U.S.C. § 103 (a) as being unpatentable over the combination of Lilja, Bouchier, Natu, Mealey, and Goldberg.

C. Claim 21 stands rejected under 35 U.S.C. § 103 (a) as being unpatentable over the combination of Lilja, Bouchier, Natu, and Goldberg.

## FINDINGS OF FACT

The following findings of fact (FF) are supported by a preponderance of the evidence.

### *Lilja*

1. As depicted in Figure 2, Lilja discloses an updateable firmware equipped with a plurality of value added software or plug-in modules (106, 107) stored in association with a firmware module (108) in a non-volatile memory device such as FLASH (14). (Abstract.)

2. Lillja discloses that the firmware module (108) may or may not be included in the updatable firmware (14). (Col. 2, ll. 20-24.)

3. Lilja indicates that the firmware module (108) represents a first category of plug-in modules stored within the flash, whereas the plug-in modules (106, 107) represent a second category of plug-in modules in the FLASH. Particularly, if the FLASH is included in a router, the firmware module (108) may initiate various data communication protocols. (Col. 4, ll. 6-14.)

4. Alternatively, as shown in Figures 3 and 4, Lilja further discloses that when the plug-in and firmware modules are stored in a compressed form within the FLASH, they are extracted into random access memory (RAM) during boot up. (Col. 2, ll. 26-33, col. 5, ll. 24-45.)

5. Upon the firmware calling a function of a plug-in stored in the RAM, the firmware references a table to locate the memory address for the extracted plug-in. (Col. 2, ll. 35-40.)

6. Additionally, Lilja discloses that the FLASH may be configured to store both single image FLASH and dual image FLASH formats. When configured to operate in dual image FLASH format, it is capable of storing both a running copy and a backup copy of firmware. (Col. 4, ll. 22-35.)

*Bouchier*

7. Bouchier discloses a method and system for managing a plurality of computer partitions, each running its own copy of a system firmware, which interfaces an operating system, thereby isolating the operating system from the hardware. (Col. 2, ll. 6-8, col. 5, ll. 8-12.)

*Natu*

8. Natu discloses a system for executing large device firmware programs wherein the BIOS of a firmware is used to load additional modules of the firmware. (Col. 4, ll. 62-66, col. 5, ll. 1-9.)

*Mealey*

10. Mealey discloses a method of booting an operating system using a soft read-only storage for emulating a firmware. Particularly, Mealey provides a pre-defined interface between the operating system and the computer's firmware for isolating the operating system from firmware dependencies. (Col. 2, ll. 45-48, ll. 61-67.)

*Goldberg*

11. Goldberg discloses a method for dynamically altering a firmware program. Particularly, Goldberg discloses loading a new routine into memory while an old routine is being executed, and redirecting calls to the new routine without rebooting. (Col. 2, ll. 23-58.)

PRINCIPLES OF LAW  
OBVIOUSNESS

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 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) wherein 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, 1739-40 (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.

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 & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2007).

Appeal 2008-0861  
Application 10/411,465

CLAIMS 1-3, 7-10, 14, AND 16-18

*Further Finding of Fact*

Independent claim 1 recites in relevant part loading a first module and a second module in a partition firmware. (Claims Appendix.)

*Appellants' Arguments*

Appellants argue that the combination of Lilja, Bouchier, Natu and Mealey does not teach these limitations. (App. Br. 15-38.) Particularly, Appellants argue that Lilja, at best, discloses a non-volatile FLASH for storing multiple firmware modules therein. However, Appellants argue that this disclosure falls short of teaching loading a first module and a second module in a partition firmware, as claimed. (App. Br. 16.) Further, Appellants argue that neither the FLASH nor the RAM is a partition firmware since they are only storage devices, as opposed to software. (*Id.* 19.) Additionally, Appellants argue that neither Bouchier, nor Natu, nor Mealey remedies the deficiencies of Lilja, and that there is insufficient rationale for combining the cited references. (*Id.* 20-38.)

*Examiner's Findings and Conclusions*

In response, the Examiner finds that Lilja teaches the claimed limitations. Particularly, the Examiner finds that Lilja's disclosure of a FLASH equipped with plug-in modules and a firmware module teaches the partition firmware having a first module and a second module. (Ans. 10-16.) Therefore, the Examiner concludes that the combination of Lilja with Bouchier, Natu, and Mealey renders claim 1 unpatentable. (*Id.*)

*Issue(s)*

Thus, the pivotal issue before us is whether one of ordinary skill would have found sufficient rationale to combine Lilja's disclosure of a FLASH having a firmware module and two plug-in modules in combination with the disclosures of Bouchier, Natu, and Mealey to yield the partition firmware, as recited in independent claim 1. We answer this inquiry in the affirmative.

*Analysis*

As set forth in the Findings of Fact section, Lilja discloses a plug-in updateable firmware exemplified as a FLASH containing plug-in modules and a firmware module. (FF. 1-2.) Alternatively, Lilja discloses that the plug-in modules and the firmware module are extracted into predetermined addresses in the RAM. (FF. 4.) Further, Lilja discloses that the firmware can initiate data communication protocols by calling plug-in functions. (FF. 3, 5.) One of ordinary skilled in the art would readily recognize that Lilja's updateable firmware teaches the claimed partition firmware. The ordinarily skilled artisan would appreciate that, similarly to the first module and the second module contained in the partition firmware, Lilja's updateable firmware includes a plurality of plug-in modules as well as a firmware module. Alternatively, the ordinarily skilled artisan would appreciate by extracting the cited modules into the RAM, Lilja in effect teaches that these modules are loaded into the RAM. We, therefore, do not agree with Appellants that the FLASH or the RAM is only a hardware

Appeal 2008-0861  
Application 10/411,465

device, and not a software/firmware device. The fact that Lilja exemplifies the updateable firmware as the FLASH or a RAM indicates that both the FLASH and the RAM do qualify as partition firmware into which the plug-in modules and the firmware module are loaded or extracted.

Appellants' argument that neither Bouchier, nor Natu, nor Mealey remedies the deficiencies of Lilja is therefore unavailing since we find no such deficiencies in Lilja for these secondary references to cure. Further, Appellants' argument that there is insufficient rationale for combining the cited secondary references with Lilja is not persuasive. One of ordinary skill would have readily recognized that, as set forth in the Findings of Fact section, the combined teachings of Lilja, Bouchier, Natu, and Mealey are prior art elements that perform their ordinary functions to predictably result in a partition firmware having a first module that routes module calls received from an operating system to a second module for subsequent execution. It follows that Appellants have not shown that the Examiner erred in concluding that the combination of Lilja, Bouchier, Natu, and Mealey renders claim independent claim 1 unpatentable.

Appellants did not provide separate arguments with respect to the rejection of claims 1-3, 7-10, 14, and 16-18. Therefore, we select independent claim 1 as being representative of the cited claims. Consequently, claims 2, 3, 7-10, 14, and 16-18 fall together with representative claim 1. 37 C.F.R. § 41.37(c)(1)(vii).

Appeal 2008-0861  
Application 10/411,465

## CLAIM 21

### *Appellants' Arguments*

Appellants argue that since claim 21 recites the limitations of claim 1, as set forth above, the combination of Lilja, Bouchier, and that Natu does not teach the limitations of claim 21 for the reasons argued above. (App. Br. 38-41.) Further, Appellants argue that since Goldberg does not remedy the deficiencies of the cited references, the combination of Lilja, Bouchier, Natu and Goldberg does not render claim 21 unpatentable. (Id.) We do not agree.

### *Analysis*

As discussed above, we have found no such deficiencies in the combination of Lilja, Bouchier, and Natu for Goldberg to cure. It follows that Appellants have not shown that the Examiner erred in concluding that the combination of Lilja, Bouchier, Natu, and Goldberg renders independent claim 21 unpatentable.

## CLAIMS 4-6, 11-13, 19, AND 20

### *Appellants' Arguments*

Appellants argue that since claim 4 recites the limitations of claim 1, as set forth above, the combination of Lilja, Bouchier, Natu, and Mealey does not teach the limitations of claim 4 for the reasons argued above. Further, they argue that since Goldberg does not remedy the deficiencies of

Appeal 2008-0861  
Application 10/411,465

the cited references, the combination of Lilja, Bouchier, Natu, Mealey and Goldberg does not render claim 4 unpatentable. (App. Br. 41-42.) We do not agree.

*Analysis*

As discussed above, we have found no such deficiencies in the combination of Lilja, Bouchier, Natu, and Mealey for Goldberg to cure. It follows that Appellants have not shown that the Examiner erred in concluding that the combination of Lilja, Bouchier, Natu, Mealey, and Goldberg renders claim 4 unpatentable.

Appellants did not provide separate arguments with respect to the rejection of claims 5-6, 11-13, 19, and 20. Therefore, we have selected claim 4 as being representative of the cited claims. Consequently, claims 5, 6, 11-13, 19, and 20 fall together with claim 4. 37 C.F.R. § 41.37(c)(1)(vii).

**CONCLUSION OF LAW**

Appellants have not shown that the Examiner erred in concluding that:

A. The combination of Lilja, Bouchier, Natu, and Mealey renders claims 1 through 3, 7 through 10, 14, and 16 through 18 unpatentable under 35 U.S.C. § 103 (a).

B. The combination of Lilja, Bouchier, Natu, Mealey, and Goldberg renders claims 4 through 6, 11 through 13, 14, 19, and 20 unpatentable under 35 U.S.C. § 103 (a).

Appeal 2008-0861  
Application 10/411,465

C. The combination of Lilja, Bouchier, Natu, and Goldberg renders claim 21 unpatentable under 35 U.S.C. § 103 (a).

#### DECISION

We affirm the Examiner's decision rejecting claims 1 through 14, and 16 through 21 as being unpatentable under 35 U.S.C. § 103(a) .

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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