THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WILLIAM G. ARNOLD,
JEHOSHUA BRUCK, JEFFREY O. KEPHART,
GREGORY B. SORKIN, STEVE R. WHITE,
DAVID M. CHESS, CHARLES E. COX,
and MYRON D. FLICKNER

Appeal No. 1997-3499
Application 08/366,281[1]

ON BRIEF

Before KRASS, BARRETT, and HECKER, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

[1] Application for patent filed December 29, 1994, entitled "Autonomous System For Recognition Of Patterns Formed By Stored Data During Computer Memory Scrubbing."

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 1, 8, 9, 16, 17, and 21. Claims 2-7, 10-15, 18-20, and 22 stand objected to.

We reverse.

BACKGROUND

The disclosed invention relates to a virus signature detection method and system for locating virus patterns during normal memory "scrubbing" operations.

Claim 1 is reproduced below.

> 1. A method for operating a computer system having a central processing unit (CPU) for processing data responsive to interrupt signals and stored instructions, having a memory for storing data in a plurality of addressable locations and having scrubbing means for the continuous autonomous detection and correction of soft bit errors in said data stored in said memory, said method comprising the steps of:
>
> (a) providing one or more items of said data read by said scrubbing means from a first memory address;
>
> (b) mapping said one or more data items to produce a code signature related to said one or more data items according to a first predetermined transformation;
>
> (c) comparing said code signature to each of one or more stored target signatures to determine a measure of similarity therebetween;
>
> (d) producing a CPU interrupt signal when said measure of similarity equals or exceeds a predetermined threshold; and

(e) repeating steps (a) through (d) for each of said plurality of memory locations.

The Examiner relies on the following prior art:

Ryan	4,479,214	October 23, 1984
Arnold et al. (Arnold)	5,442,699	August 15, 1995 (filed November 21, 1994)
Watson et al. (Watson)	5,475,839	December 12, 1995 (filed November 16, 1994)

Claims 1, 8, 9, 16, 17, and 21 stand rejected under 35 U.S.C. § 103 as being unpatentable over Arnold, Watson, and Ryan. The Examiner finds that Arnold teaches detecting possible viruses within a computer's memory, Watson teaches halting a system from booting and issuing a warning to the user if corrupted files are detected prior to boot, and Ryan teaches scrubbing means. The Examiner concludes that it would have been obvious to utilize the scrubbing means of Ryan to check for soft errors and then subsequently to check for virus errors as taught by Arnold and Watson because it would enable the system to first check for any soft errors detected by the scrubbing process prior to virus detection (Final Rejection, page 4).

We refer to the Final Rejection (Paper No. 10) and the Examiner's Answer (Paper No. 13) (pages referred to as "EA__") for a statement of the Examiner's position and to the Brief (Paper No. 12) (pages referred to as "Br__") and the Reply Brief (Paper No. 14) for Appellants' arguments thereagainst.

OPINION

Claims 1, 8, 9, 16, 17, and 21 are grouped to stand or fall together (Br7). Claim 1 is analyzed as representative.

Initially, as a matter of claim interpretation, we observe that claim 1 does not recite where the virus signature checking and interrupt operations of steps (b) through (d) are performed. Claim 1 does not require a low-level, hardware-implemented virus checker and does not preclude steps (b) through (d) from being performed by the CPU; this is consistent with the disclosure which states that the steps can be performed by a conventional data processor (specification, page 13, lines 24-28; claim 21). Accordingly, Appellants' arguments that "Arnold does not suggest or motivate the use of a low-level, hardware-implemented memory management function to check for viruses" (Br10) and that "[c]learly, in Claim 1 the CPU *is not* involved in a virus (signature) checking

operation" (RBr4), are not commensurate in scope with the claim language and are not persuasive.

Appellants argue (Br13):

> The applicant concedes that the operation of Watson's and Arnold's systems would include memory scrubbing. However, such memory scrubbing would be an automatically initiated, hardware-based function performed without cooperation of a CPU. The signature detection and virus checking performed by Watson and Arnold's algorithm, on the other hand, would be performed by the CPU. In this, there is no suggestion that a memory scrubber or a scrubbing means be employed to provide data for the purpose of producing a code signature. Instead, the data would be provided to the CPU by the memory controller *after* any soft or hard errors were corrected by the scrubber, within its capability. [Underlining added.]

The critical limitations at issue are "scrubbing means for the continuous autonomous detection and correction of soft bit errors in said data stored in said memory" and "providing one or more items of said data read by said scrubbing means from a first memory address." Prior art autonomous scrubbing means operate independently and transparently to the CPU (specification, page 2, lines 9-11), as compared to alternative "software scrubbing" schemes (specification, page 2, lines 11-13). Although an autonomous scrubbing means is part of the memory controller, it reads out, tests, and rewrites addresses containing a single soft error with correct

data independently (autonomously) from the part of the memory controller that reads out data for the CPU. Therefore, the issue is whether it would have been obvious to use autonomous scrubbing means to provide data to a virus signature checking operation.

The Examiner states (EA12): "The examiner's Final rejection states that it would have been obvious to utilize the scrubbing means to initially check for soft errors, as taught by Ryan, and then subsequently check for virus errors, as taught by Arnold and Watson because it would enable one of ordinary skill in the art to perform well known scrubbing operations prior to implementing Arnold's and Watson's operations, thus allowing soft errors to be detected prior to any viral detections."

This reasoning does not address the memory scrubber providing data for virus signature detection. The combination of Watson and Arnold with the memory scrubber of Ryan would have suggested a hardware memory scrubber of Ryan that operates independently from the virus signature detection process of Arnold and Watson. The Examiner does not point to any teaching or suggestion for the memory scrubber means

providing data for a virus detection process or any other external process.

The Examiner states (EA12): "The appellant's admission that Arnold's and Watson's system would utilize scrubbing techniques strengthens the examiner's position that one of ordinary skill in the art would utilize such well known techniques within the combined system of Watson and Arnold." The Examiner further states (EA13): "The appellant states on lines 17-24 of page 13, that the Arnold and Watson's teachings suggest that the 'data would be provided to the CPU by the memory controller after any soft or hard errors were corrected by the scrubber, within its capability'. This clearly suggests that the appellant is admitting that the teachings of Arnold and Watson suggest the ability for a memory scrubber to be utilized to correct any errors within its capability, and then send the data to the CPU, which performs the virus (signature) checking operations."

Appellants respond that they did not admit that a memory scrubber means would provide data for the virus checking of Arnold and Watson (RBr2): "Simply because memory scrubbing is an automatic background process in modern computer operations

does not suggest the use of its output in the manner recited in the rejected claims. It is stated emphatically that the prior art fails to teach using a scrubbing means as an element or as the performer of a step in the detection of a virus."

We agree with Appellants. Utilizing the scrubbing means of Ryan in combination with the virus detector in Arnold and/or Watson does not suggest the limitation at issue that the scrubbing means provides data to a virus signature detection process. As Appellants note, the scrubbing means would function as an independent background process, separate from whatever mechanism is used to read out data to perform the virus checking. That data is provided to the CPU by the memory controller, as stated by Appellants at page 13 of the brief, does not imply that data is provided to the CPU by the memory scrubber part of the memory controller. The memory scrubber means reads out, tests, and rewrites addresses containing a single soft error with correct data independently (autonomously) from the part of the memory controller that reads out data for the CPU.

The Examiner recognizes that claim 1 recites that the memory scrubber means provides data to the detection processes

(EA12-13) and states (EA13): "The examiner contends that the prior art suggests this capability by the fact that memory scrubbing is well known in the art, and utilized in computer systems to check for soft errors, as admitted by the appellant, prior to processing of that data, and one of ordinary skill in the art would have recognized this and allowed Arnold's and Watson's combined system to utilize such techniques as well for other advantages known to scrubbing procedures."

Again, the Examiner fails to point to any suggestion in the references or the knowledge of those of ordinary skill in the art for modifying the prior art scrubber means of Ryan to perform the additional task of providing data for the virus signature checking operation. It does not even appear that the Examiner recognizes that a modification of the prior art scrubber means is necessary. We find no suggestion or motivation in the references to modify a scrubber means to read out data for use by other processes than the memory scrubbing process.

For the reasons stated above, we conclude that the Examiner has failed to establish a prima facie case of obviousness with respect to claim 1. Claims 9, 17, and 21 contain similar limitations to the missing critical limitation about the scrubber means reading out data for use by the virus signature detection process and, accordingly, stand with claim 1. The rejection of claims 1, 8, 9, 16, 17, and 21 is reversed.

REVERSED

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Administrative Patent Judge)
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) BOARD OF PATENT
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