

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DOUGLAS G. ROSNER
and THOMAS P. MIODUSZEWSKI

Appeal No. 1996-1097
Application 08/058,110¹

ON BRIEF

Before THOMAS, BARRETT, and GROSS, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

¹ Application for patent filed May 7, 1993, entitled "Memory Efficient Computer System And Method For Controlling An Automotive Ignition System."

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This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 1-12.

We reverse.

BACKGROUND

The disclosed invention relates to a memory efficient computer system and method for controlling an automotive ignition system. As shown in figure 1, the ignition system has ignition coils 12 organized, for example, into two banks, BANK 1 and BANK 2, with various input/output (I/O) devices 18 relaying signals to and from the ignition coil banks. The computer system memory 20 includes a read only memory (ROM) 36 for storing program routines and a random access memory (RAM) 34 for storing data. Figure 2 shows a partial map of the RAM segment 34. RAM 34 is organized into sets of registers 38 that store ignition coil input and output signals relayed by I/O devices 18. Importantly, there is a constant address offset (in this case six bytes) between corresponding sets of registers in BANK 1 and BANK 2. "For example, the COIL2_H register associated with one ignition coil bank 14 [BANK 2] has a hexadecimal address of \$0006, which is offset by six bytes in the RAM segment 34

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from the COIL1_H register associated with the remaining ignition coil bank 14 [BANK 1] and having a hexadecimal address of \$0000." (Specification, page 10, line 32, through page 11, line 3.)

This constant address offset between sets of corresponding registers in different banks permits a single program routine stored in the ROM 36 to independently control both ignition coil banks using indexed addressing mode instructions. This is illustrated by comparing the prior art control system of figure 6 with the invention in figure 7. In figure 6, the instructions for ignition BANK 1 are executed 100 and then the instructions for ignition BANK 2 are executed 102. "[S]uch a program routine requires the instructions for controlling an ignition coil bank 14 to be duplicated for each ignition coil bank 14, thereby using more space in the ROM segment 36 and increasing the likelihood of error when the instructions are encoded." (Specification, page 20, lines 7-12.)

In figure 7, the same instructions are executed 112 for both ignition coil banks using an indexed addressing mode together with a constant address offset to select between

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corresponding sets of registers, so a single program routine controls both ignition coil banks 14. The first time through the program routine block 112 the offset is zero (block 110) and the second time through the program routine block 112 the offset is six (block 116). The single routine requires less space in ROM than the two routines of the prior art.

Claim 1 is reproduced below.

1. In an automotive ignition system having a plurality of ignition coil banks, each bank having at least one ignition coil for energizing a corresponding spark plug, an ignition control system comprising:

a plurality of input/output (I/O) devices for relaying ignition coil signals, each I/O device in electrical communication with one of the plurality of ignition coil banks, the banks having at least one set of corresponding I/O devices relaying similar ignition coil signals;

first storage means for storing the similar signals relayed by sets of corresponding I/O devices, the similar signals having addresses in the first storage means with a constant offset from each other;

second storage means for storing a plurality of program routines, each routine for processing and generating the similar signals relayed by sets of corresponding I/O devices; and

accessing means for accessing the similar signals in the first storage means via the program routines in the second storage means using an indexed addressing mode and the constant address offset such that a single

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program routine controls one set of corresponding I/O devices independent of the ignition coil bank involved, thereby reducing space utilized in the second storage means.

The examiner relies on the following prior art references:

Jenkins et al. (Jenkins)	4,149,239	April 10,
1979		
Kumagai et al. (Kumagai)	4,887,215	December
12, 1989		

Claims 1-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kumagai and Jenkins. The Examiner finds that Kumagai discloses the claimed invention except for the I/O devices attached to a plurality of ignition coil banks, storing similar signals of the ignition coil banks with a constant address offset, and using an indexed addressing mode and the constant address offset to permit a single program routine to control the different banks. The Examiner relies on Jenkins for these missing features.

We refer to the Final Rejection (Paper No. 7) (pages referred to as "FR__") and the Examiner's Answer (Paper No. 16) (pages referred to as "EA__") for a statement of the Examiner's position and to the Substitute Appeal Brief

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(Paper No. 14) (pages referred to as "Br__") for a statement of Appellants' arguments thereagainst.

OPINION

Appellants limit their arguments to arguing that Jenkins is directed to an associative memory for improving overall memory speed and "fails to disclose either the indexed addressing mode and constant address offset feature" (Br5). Appellants further argue that Kumagai and Jenkins do not disclose the indexed addressing mode and constant address offset limitations "because they fail to teach or recognize the problem solved by the Applicants' claimed invention, that problem being the inefficient use of computer memory in a control system" (Br6).

The Examiner finds that "Jenkins et al also discloses the memory addresses for facilitating storage" (FR3; EA4) and concludes that it would have been obvious to modify Kumagai by incorporating "the addresses from the system of Jenkins et al because such modification will enable easy storage step for the similar signals of the ignition coils, and easy access for retrieving the stored signals, thereby providing a more efficient memory system for the internal

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combustion engine ignition system" (FR4; EA4). An objective reading of the rejection shows that the Examiner has taken the mention of the word "address" to meet all of the disputed claim limitations. While it is true that the memory modules 30 through 33 in Jenkins access data by address on the address (A) bus, this says nothing about organizing similar data of plural sets with a constant address offset. Nor does the mere teaching of an address suggest using an indexed addressing mode and the constant address offset such that only a single program routine is required. The Examiner glosses over these limitations without any analysis in the statement of the rejection. The Examiner expressly acknowledges (EA8) Appellants' argument that Jenkins "fails to disclose either the indexed addressing mode and constant address offset feature" (Br5), but then does not address how the memory arrangement of Jenkins satisfies these specific limitations. The Examiner has manifestly failed to establish a prima facie case of obviousness. We have independently considered the teachings of Jenkins and find that it does not teach storing sets of data with similar data of the sets at a constant address

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offset and using an indexed addressing mode and the constant address offset to permit a single program routine to access the different sets of data.

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For the reasons discussed above, the rejection of
claims 1-12 is reversed.

REVERSED

	JAMES D. THOMAS)	
	Administrative	Patent Judge)
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)	BOARD OF
PATENT)	
	LEE E. BARRETT)	APPEALS
	Administrative Patent Judge)	AND
)	INTERFERENCES
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)	
	ANITA PELLMAN GROSS)	
	Administrative Patent Judge)	

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