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(54) **MICROCONTROLLER INSTRUCTION SET**

(75) Inventors: **Edward Brian Boles**, Mesa, AZ (US); **Rodney Drake**, Phoenix, AZ (US); **Darrel Johansen**, Tempe, AZ (US); **Sumit Mitra**, Tempe, AZ (US); **Joseph Triece**, Phoenix, AZ (US); **Randy Yach**, Phoenix, AZ (US)

(73) Assignee: **Microchip Technology Incorporated**, Chandler, AZ (US)

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(58) **Field of Search** 712/220

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Primary Examiner—Eric Coleman
(74) *Attorney, Agent, or Firm*—Baker Botts L.L.P.

(57) **ABSTRACT**

A microcontroller apparatus is provided with an instruction set for manipulating the behavior of the microcontroller. The apparatus and system is provided that enables a linearized address space that makes modular emulation possible. Direct or indirect addressing is possible through register files or data memory. Special function registers, including the Program Counter (PC) and Working Register (W), are mapped in the data memory. An orthogonal (symmetrical) instruction set makes possible any operation on any register using any addressing mode. Consequently, two file registers to be used in some two operand instructions. This allows data to be moved directly between two registers without going through the W register. Thus increasing performance and decreasing program memory usage.

142 Claims, 95 Drawing Sheets

