Patent Watch

by Rich Belgard, Contributing Editor

The following U.S. Patents related to microprocessors were issued recently. Please e-mail comments or criticisms to belgard@umunhum.stanford.edu.

5,452,434
Clock control for power savings in high-performance central processing units
Issued: September 19, 1995
Inventor: James R. MacDonald
Assignee: AMD
Filed: July 14, 1992
Claims: 24
A clock-controller circuit for performing a power-saving feature in high-performance microprocessors. The invention provides a sleep mode or clock-idle mode for an execution unit (EU) when data is not available for the EU because memory units, I/O devices, or internal caches are unable to provide data or instructions. The clock circuit stops the clock signals in response to a no-data-available signal from a bus unit and a data-required signal from the EU.

5,452,423
Two-ROM multibyte microcode address-selection method and apparatus
Issued: September 19, 1995
Inventors: James A. Picard, et al
Assignee: Chips and Technologies
Filed: June 13, 1991
Claims: 11
A decoder for decoding microcoded instruction sets which have operations in which not all the bits of an instruction word are required. The decoder has two registers for receiving and holding the first and second byte of instructions at a time along with a ROM connected to the register for decoding the first byte into control signals. One control signal indicates that a second instruction byte is required. A second ROM is connected to the register for decoding a portion of the second byte. A mux selects from the first and second ROMs in response to the control signal.

5,451,892
Clock-control technique and system for a microprocessor including a thermal sensor
Issued: September 19, 1995
Inventor: Joseph A. Bailey
Assignee: AMD
Filed: October 3, 1994
Claims: 20
A clock-control circuit is provided to control the frequency of a microprocessor clock signal that supplies an internal clock signal to a CPU core of the microprocessor. An output signal from an on-die thermal sensor is provided to two temperature-indicator units. Each asserts a signal when the on-chip temperature of the die exceeds a programmable level, which can be used to alter the frequency of the clock.

5,450,605
Boundary markers for indicating the boundary of a variable-length instruction to facilitate parallel processing of sequential instructions
Issued: September 12, 1995
Inventors: Edward Grochowski, et al
Assignee: Intel
Filed: Jan. 28, 1993
Claims: 5
A method and apparatus for determining the length of variable-length instructions that appear sequentially in an instruction stream. The apparatus includes: a circuit that provides a boundary marker for each instruction; a circuit for processing instructions in sequence; a circuit for determining an actual boundary of a first instruction as it is processed; a circuit for comparing the boundary marker and the actual boundary of the first instruction to determine whether they match; a circuit for updating the boundary marker to the actual when the boundary value and the actual boundary of the first instruction do not match; and a circuit for indicating a boundary between the first instruction and a next instruction based on the boundary marker of the first instruction.

5,450,558
System for translating virtual address to real address by duplicating mask information in real page number corresponds to block entry of virtual page number
Issued: September 12, 1995
Inventor: Mark A. Ludwig
Assignee: Hewlett-Packard
Filed: May 27, 1992
Claims: 8
An apparatus and method that combines the mask information with the virtual page number in each block entry of a TLB of a virtual memory system. The invention defines a range of pages that are translated by a block entry, thus providing space in the virtual page number for the mask bits. The mask information is duplicated in the real page number of the block entry that corresponds to the virtual page number. This duplication allows the mask information to be easily sent to the bus driver circuits, where it is needed to select the bits that form the real page number. ♦