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(21) International Application Number: PCT/US96/20522 (22) International Filing Date: 17 December 1996 (17.12.96) (30) Priority Data: 08/574,719 19 December 1995 (19.12.95) US		2-8-10, Kubodai, Ryugasaki-shi, Ibaraki 301 (JP). EITAN, Benny (IL/IL); 25 Stephen Weiss, 31015 Haifa (IL). (74) Agents: TAYLOR, Edwin, H. et al.; Blakely, Sokoloff, Taylor & Zafman, L.L.P., 7th floor, 12400 Wilshire Boulevard, Los Angeles, CA 90025 (US).
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The diagram illustrates the RETNAP system architecture, divided into two main sections: RETNAM UNIT 1001 and RETNAM UNIT 1008.

RETNAM UNIT 1001:

- ROM Section:** Includes TRANSITION UNIT 1006, ENDS UNIT 1004, and MICROCODE ROM 1011.
- Decoding and Mapping:** MICROCODE ROM 1011 feeds into DECODE UNIT 1002, which then feeds into TAG MODIFIER UNIT 1001. TAG MODIFIER UNIT 1001 outputs to TAGS 1020.
- Mapping Units:** TAGS 1020 feed into FPFPD MAPPING TABLE 1022 and TAGS 1020. FPFPD MAPPING TABLE 1022 feeds into FPFPD MAPPING UNIT 1020. FPFPD MAPPING UNIT 1020 feeds into FP STATUS REGISTER 1020.
- Integer Mapping:** FP STATUS REGISTER 1020 feeds into INTEGER MAPPING TABLE 1042. INTEGER MAPPING TABLE 1042 feeds into INTEGER MAPPING UNIT 1040.
- Execution:** INTEGER MAPPING UNIT 1040 feeds into DATA ALIGNMENT UNIT 1000, which then feeds into EXECUTION UNIT 1010.
- Other Components:** A TAGS 1020 block also feeds into EXECUTION UNIT 1010. A TAGS 1020 block also feeds into FP STATUS REGISTER 1020.

RETNAM UNIT 1008:

- Buffer Registers:** BUFFER REGISTERS 1008 and CONTROL REGISTER 1004.
- FPFPD Registers:** FPFPD REGISTERS 1022.
- Integer Registers:** INTEGER REGISTERS 1006.
- Control and Addressing:** CONTROL REGISTER 1004 feeds into BUFFER REGISTERS 1008. BUFFER REGISTERS 1008 feed into FPFPD REGISTERS 1022. FPFPD REGISTERS 1022 feed into INTEGER REGISTERS 1006. INTEGER REGISTERS 1006 feed into EXECUTION UNIT 1010.
- Addressing:** BUFFER REGISTERS 1008 feed into TAGS 1020. TAGS 1020 feed into FP STATUS REGISTER 1020. FP STATUS REGISTER 1020 feeds into INTEGER MAPPING TABLE 1042. INTEGER MAPPING TABLE 1042 feeds into INTEGER MAPPING UNIT 1040. INTEGER MAPPING UNIT 1040 feeds into DATA ALIGNMENT UNIT 1000, which then feeds into EXECUTION UNIT 1010.

A method and apparatus for executing floating point and packed data instructions using a single physical register file that is aliased. According to one aspect of the invention, processor is provided that includes a decode unit (1002), a mapping unit (1004), and a storage unit (1006). The decode unit (1002) is configured to decode instructions and their operands from at least one instruction set including at least a first and second set of instructions. The storage unit (1006) includes a physical register file (1020). The mapping unit (1004) is configured to map operands used by the first set of instructions to the physical register file in a stack referenced manner. In addition, the mapping unit (1004) is configured to map operands used by the second set of instructions to the same physical register file in a non-stack reference manner.