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Glasco

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(54) **METHODS AND APPARATUS FOR SPECULATIVE PROBING WITH EARLY COMPLETION AND DELAYED REQUEST**

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This patent is subject to a terminal disclaimer.

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G06F 12/16 (2006.01)

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(58) **Field of Classification Search** 711/141–149, 711/130, 135–136, 119–122, 117–118; 710/316–317, 710/100, 315
See application file for complete search history.

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(57) **ABSTRACT**

According to the present invention, methods and apparatus are provided for increasing the efficiency of data access in multiple processor, multiple cluster systems. A cache coherence controller associated with a first cluster of processors can determine whether speculative probing can be performed before forwarding a data access request to a second cluster. The cache coherence controller can send the data access request to the second cluster if the data access request can not be completed locally.
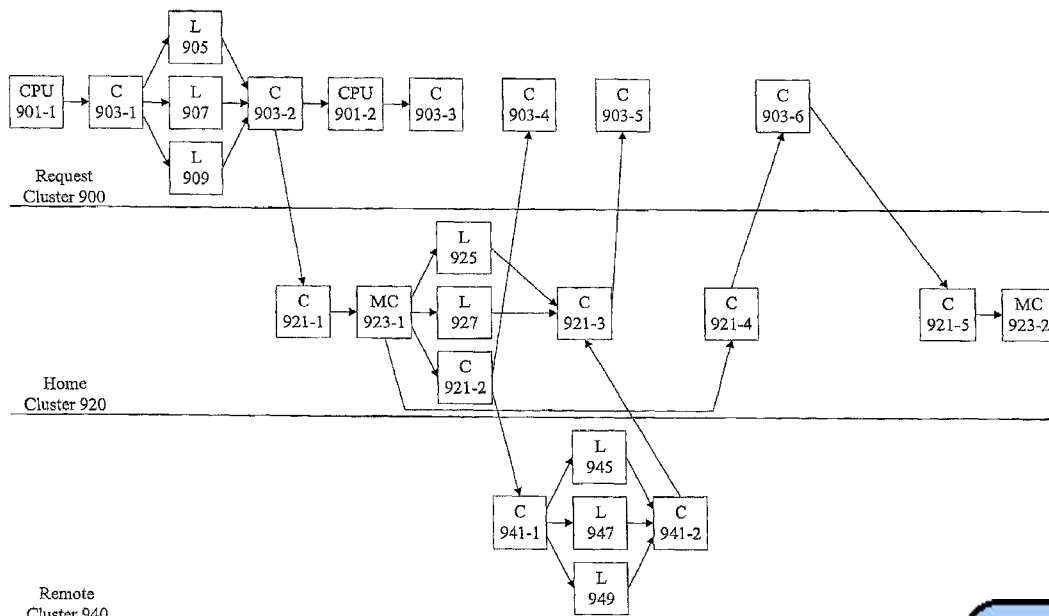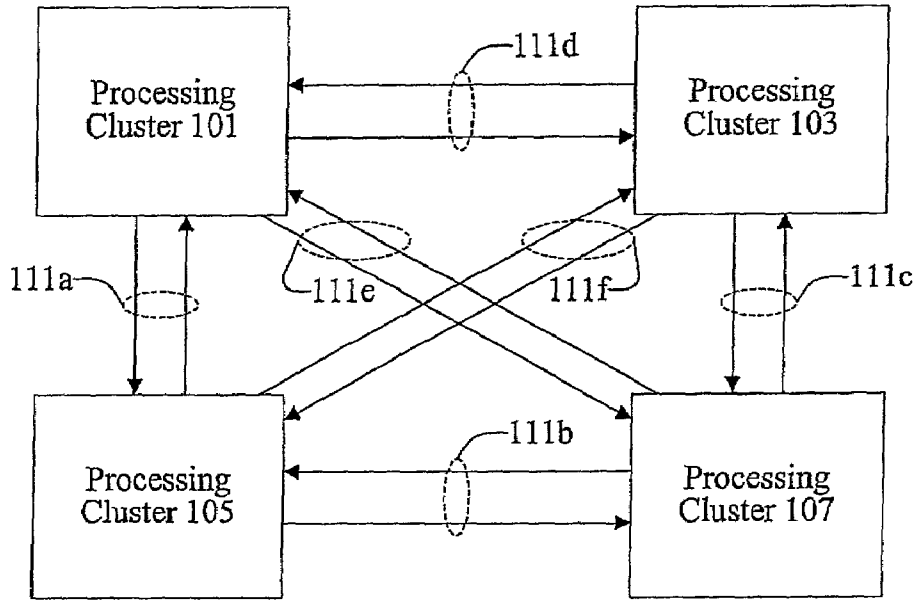
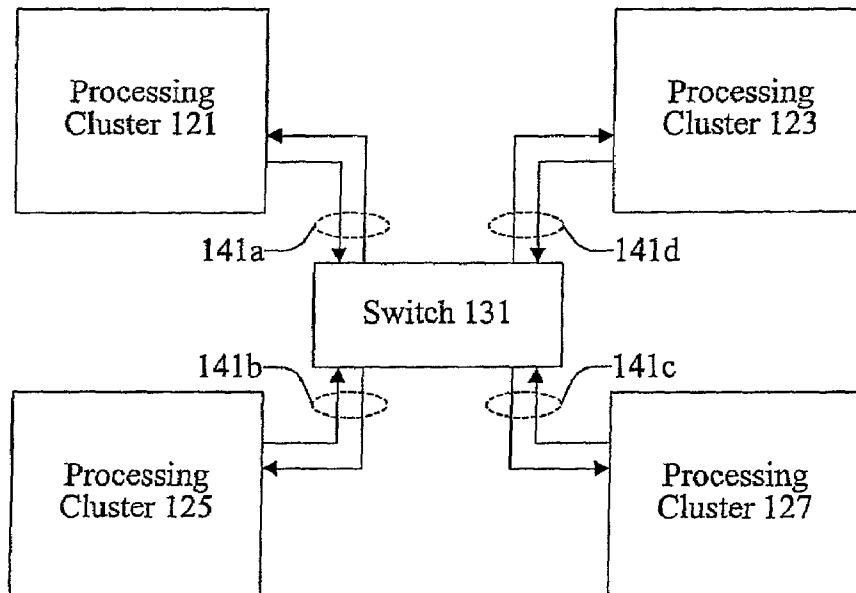**51 Claims, 15 Drawing Sheets**

Figure 1A

Figure 1B

Figure 2

Figure 3

230

Coherent Interface 307

Protocol Engine 305

Noncoherent Interface 311

Pending Buffer 309

Figure 4

DOCKET ALARM
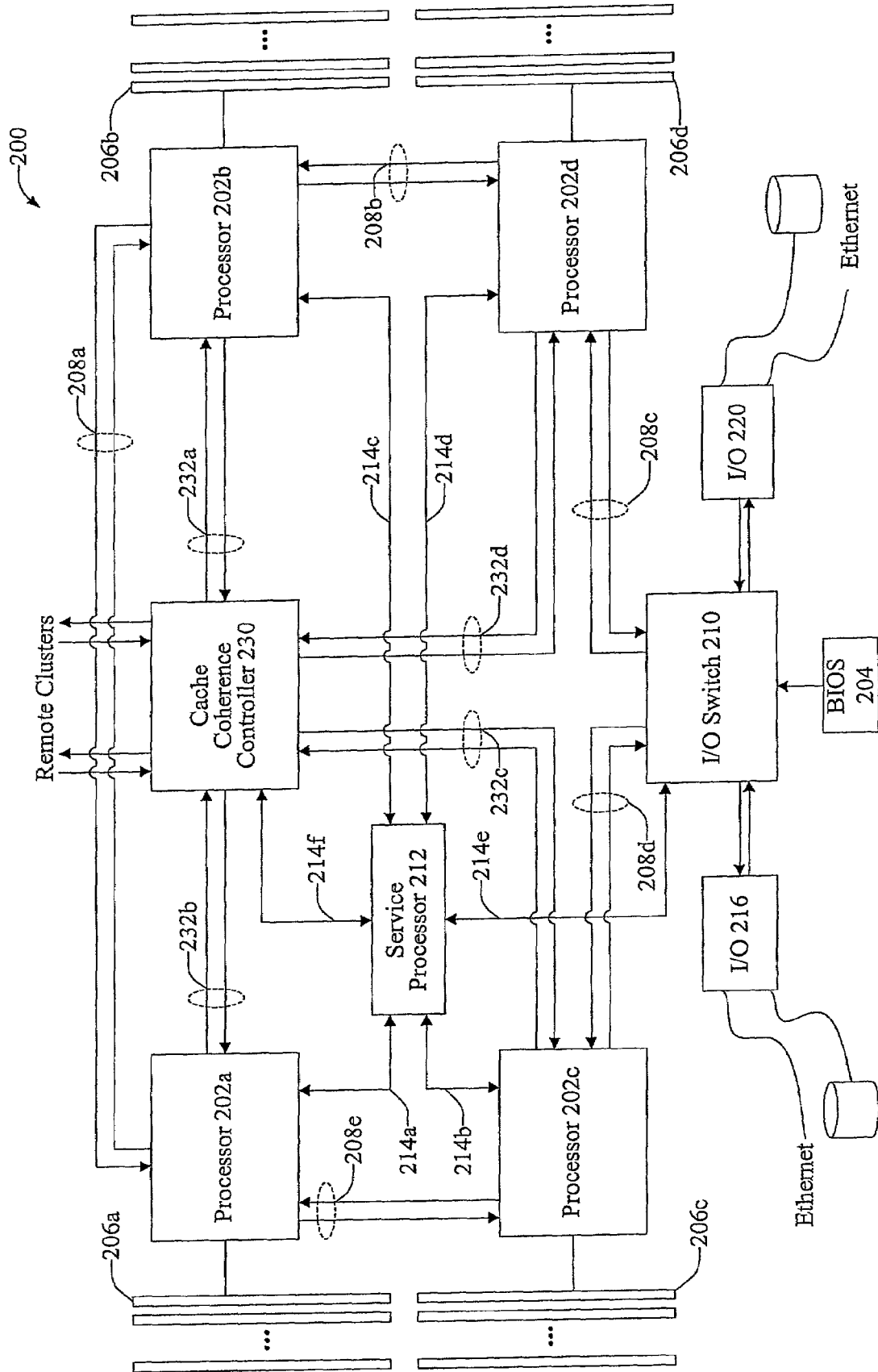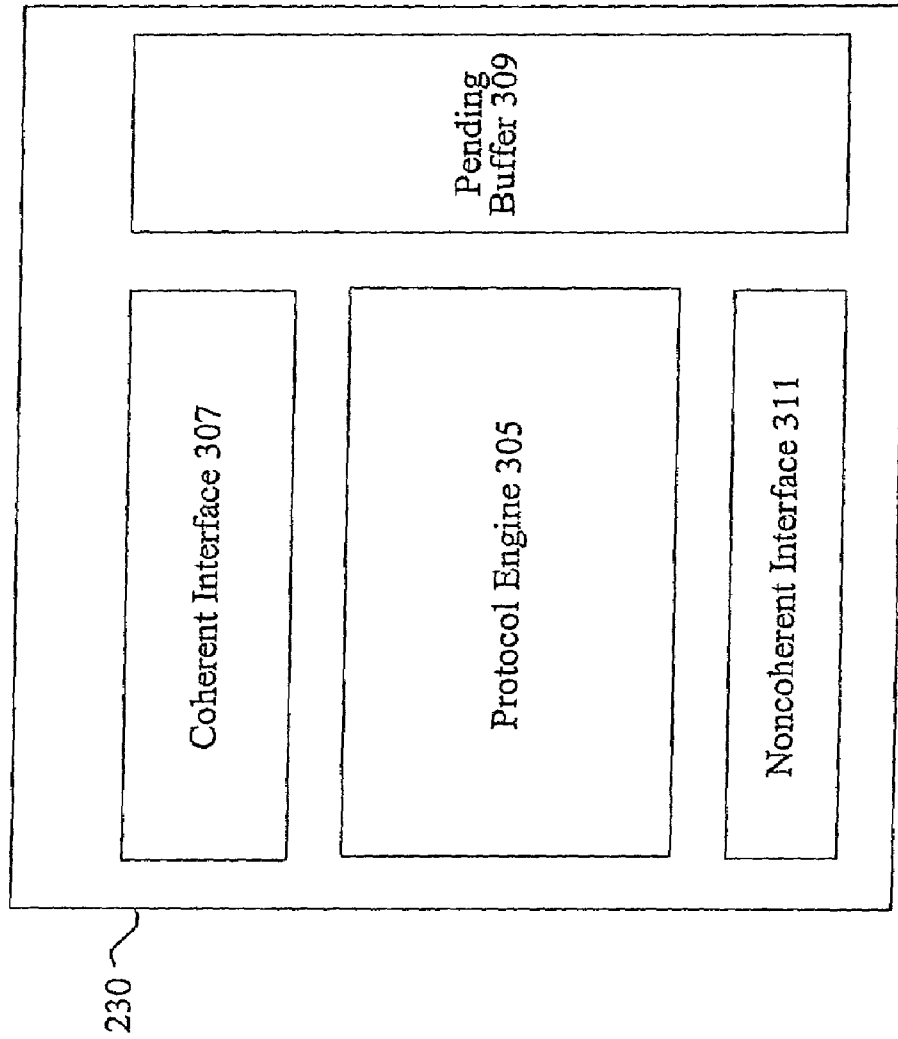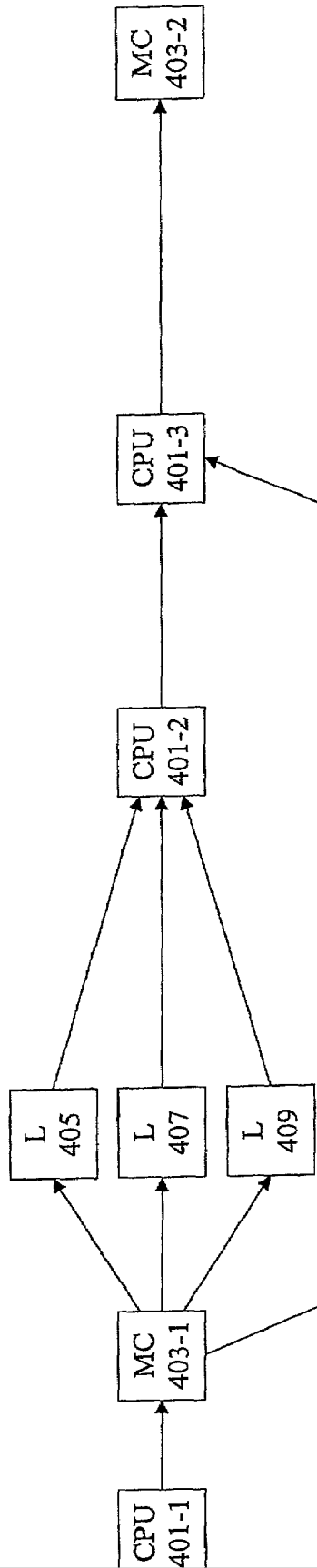
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