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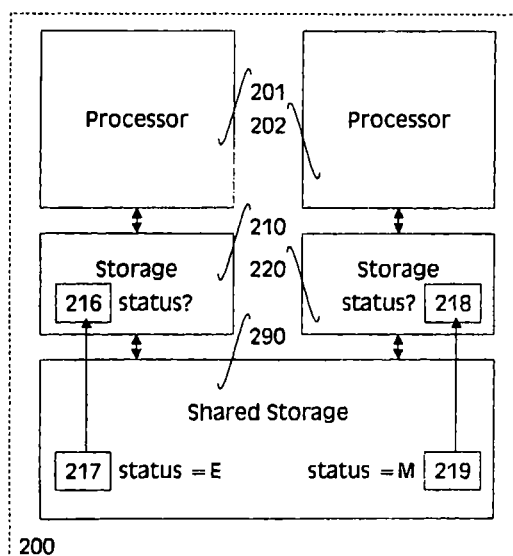
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(54) Title: METHOD AND APPARATUS FOR SCALABLE DISAMBIGUATED COHERENCE IN SHARED STORAGE HIERARCHIES



(57) Abstract: Scalable methods for disambiguating shared cache accesses in multi-level cache hierarchies of multiprocessing systems are disclosed providing for improved system performance and reduced cost. For one embodiment of a coherent shared storage hierarchy, a shared data storage unit provides portions to hold data and portions to hold corresponding status encodings. The shared storage unit may be, for example a shared cache and the data portions may be cache lines. The status encoding corresponding to a particular cache line provides enough information to disambiguate a data request to shared storage without resorting to prior methods of snooping a shared bus or of transmitting backward status inquiries to private storage. Shared-storage control transmits the data from shared storage in response to the data request if its corresponding status encoding indicates a clean status, meaning that no private copies of the requested data have been modified. On the other hand, shared-storage control transmits a data request to a private storage unit if the corresponding status encoding indicates a dirty status, meaning that a copy of the requested data in private storage has been modified. The private storage unit, in turn provides a coherent copy of the requested data to the shared storage unit. Shared-storage control then proceeds to satisfy the initial data request with the coherent copy provided by the private storage unit.

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