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(54) Title: REDUCING SYNCHRONIZATION RELIANCE IN GARBAGE COLLECTION MARKING

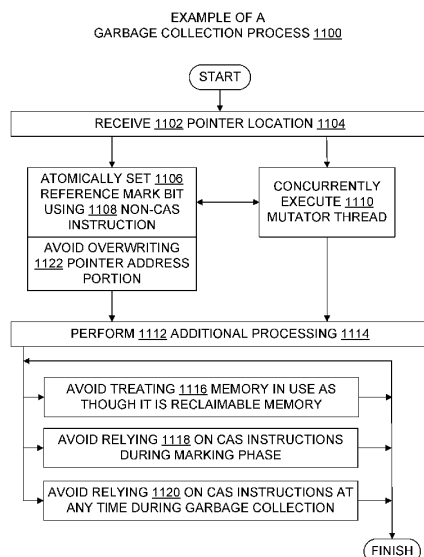


Fig. 11

(57) Abstract: Memory reclamation is tailored to avoid certain synchronization instructions, speeding concurrent garbage collection while preserving data integrity and availability. Garbage collection reclaims objects no longer in use, or other unused areas of memory. Pointers are partitioned into address portions holding address values and garbage collection portions having a special bit. Marking code writes only the garbage collection portions, setting the special bit as a mark reference, relocation candidate, etc. Mutator threads may concurrently mutate the entire pointer to update the address, but mutation does not cause incorrect reclamations or failure of operations such as relocation. Execution speed is increased by avoiding certain synchronization instructions in the garbage collector, and using different atomic writes instead. Mutators run in user or kernel address spaces. The garbage collector may enclose partitioned pointers and their use, to avoid runtime errors by code that expects references to be in a canonical nonpartitioned form.

Declarations under Rule 4.17:

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- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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