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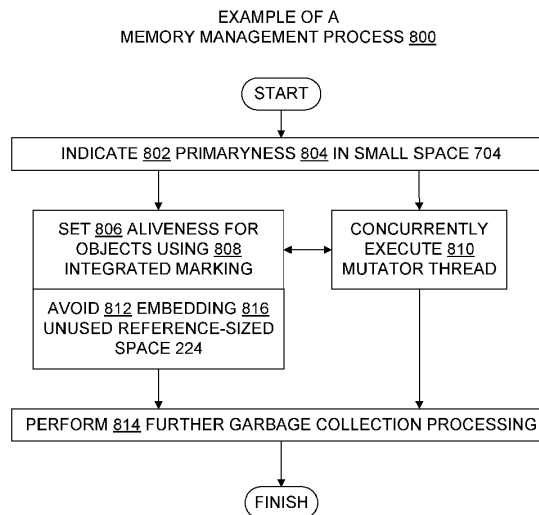


Fig. 8

(57) **Abstract:** Managing secondary objects efficiently increases garbage collection concurrency and reduces object storage requirements. Aliveness marking of secondary objects is integrated with aliveness marking of referenced objects. Allocation of reference-sized secondary object identifier fields in objects which are not primary objects is avoided; a dedicated bit specifies primary objects, together with an object relationship table. A primary object is one with at least one secondary object which is deemed alive by garbage collection if the primary object is alive, without being a referenced object of the primary object. Any referenced objects of the alive primary object will also still be deemed alive. Code paths for marking referenced objects can be shared to allow more efficient secondary object marking. Primary-secondary object relationships may be represented in dependent handles, and may be specified in a hash table or other data structure.

[Continued on next page]

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