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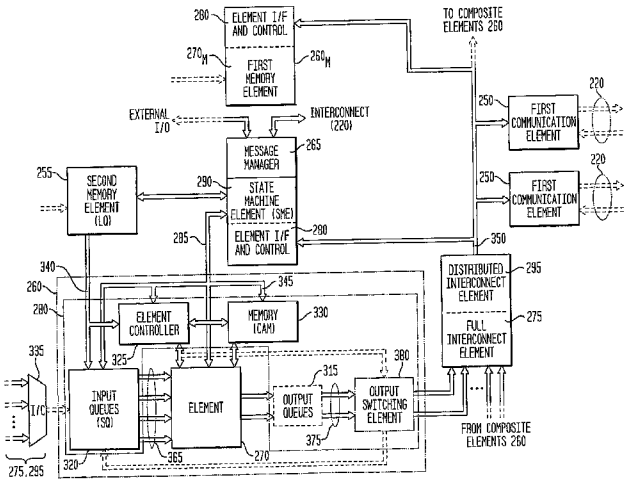
(54) **Title:** ELEMENT CONTROLLER FOR A RESILIENT INTEGRATED CIRCUIT ARCHITECTURE



(57) **Abstract:** The exemplary embodiments provide a resilient integrated circuit. An exemplary IC comprises a plurality of composite circuit elements, a state machine element (SME), and a plurality of communication elements. Each composite circuit element comprises an element controller, an element interface and a selected circuit element which may vary by element type, and which may be configurable. The state machine element assigns various functions based on element type, such as assigning a first configuration to a first element type, assigning a second configuration to a second element type, and providing a first data link for the corresponding assignments. The element controller controls the execution of data operations by the circuit element. Function assignment, routing, fault detection, and re-assignment and data re-routing can occur in real time for a wide variety of programs and algorithms, providing for the IC to continue the same functioning despite defects which may arise during operation.

WO 2007/149472 A2