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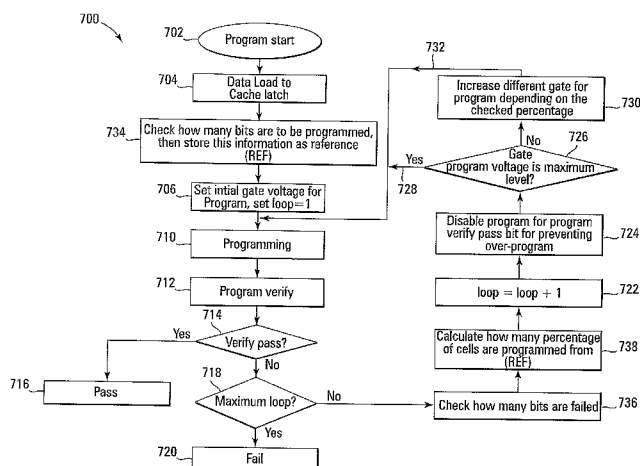
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(54) Title: PROGRAM METHOD FOR FLASH MEMORY WITH OPTIMIZED VOLTAGE LEVEL DEPENDENT OF THE NUMBER OF BITS DETECTED TO HAVE FAILED PROGRAMMING



(57) Abstract: A non-volatile memory device and programming process is described that increases the programming voltage of successive programming cycles in relation to the percentage of the data bits that failed programming verification during the previous programming cycle and were not correctly programmed into the memory array. This allows for a faster on average program operation and a more accurate match of the subsequent increase in the programming voltage to the non-volatile memory device, the specific region or row being programmed and any changes due to device wear. In one embodiment of the present invention the manufacturing process/design and/or specific memory device is characterized by generating a failed bit percentage to programming voltage increase profile to set the desired programming voltage delta/increase. In another embodiment of the present invention, methods and apparatus are related for the programming of data into non-volatile memory devices and, in particular, NAND and NOR architecture Flash memory.