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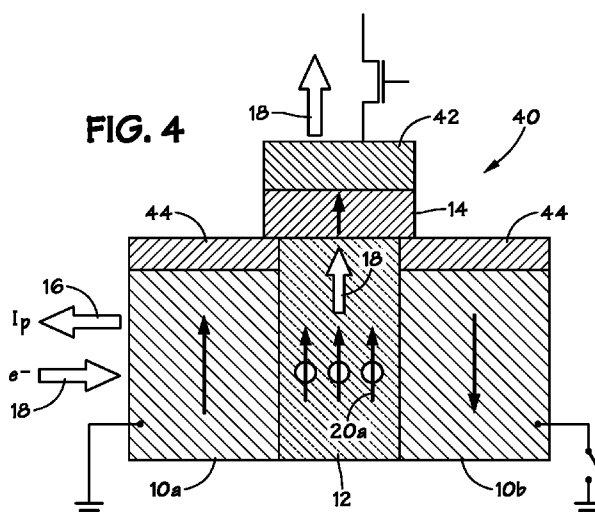
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(54) Title: SPIN-TORQUE TRANSFER MAGNETIC MEMORY CELL STRUCTURES WITH SYMMETRIC SWITCHING AND SINGLE DIRECTION CURRENT PROGRAMMING



(57) Abstract: Techniques are provided for programming a spin torque transfer magnetic random access memory (STT-MRAM) cell using a unidirectional and/or symmetrical programming current. A unidirectional programming current flows through the free region of the STT-MRAM cell in one direction to switch the magnetization of the free region in at least two different directions. A symmetrical programming current switches the magnetization of the free region to either of the two different directions using a substantially similar current magnitude. In some embodiments, the STT-MRAM cell includes two fixed regions, each having fixed magnetizations in opposite directions and a free region configured to be switched in magnetization to be either parallel with or antiparallel to the magnetization of one of the fixed regions. Switching the free region to different magnetization directions may involve directing the programming current through one of the two oppositely magnetized fixed regions.