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(54) **DYNAMICALLY RECONFIGURABLE  
SYNCHRONOUS MOTORS AND  
GENERATORS**

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(57) **ABSTRACT**

An apparatus has a plurality of poles facing an air gap, and the poles are configured to generate a magnetic field in the air gap. The poles include a group of unchanged poles and a group of reversible poles, where a polarity of each reversible pole is configured to be changed during an operation mode, and after the polarity has been changed, each reversible pole and at least an adjacent unchanged pole in effect merged into one augmented pole, such that the pole number of the magnetic field in the air gap is changed.