United States Patent [19]

Stadelmaier et al.

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[54] **METHOD OF PRODUCING HIGH PERFORMANCE PERMANENT MAGNETS**

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[52] **U.S. Cl.** **148/101**; 148/104; 419/12; 419/45; 419/46

[58] **Field of Search** 148/100, 101, 102, 103, 148/104, 105; 419/12, 29, 38, 45, 46

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[57] **ABSTRACT**

A method of producing high performance permanent magnets is disclosed in which particles of a master alloy consisting of Fe_2B having a maximum particle size of 50 microns is admixed with Fe powder and particles of a rare earth capable of combining with Fe and B to form a tetragonal compound of $Fe_{14}R_2B$ type. The admixture is compacted and a magnetic material is formed of the master alloy, Fe powder and rate earth particles which includes a major phase of at least one intermetallic compound of the Fe-R-B type having a crystal structure of the substantially tetragonal system and while the particle size of the crystal structure is controlled by sintering the compacted admixture at a temperature of about 700° C. to 1000° C. for from a fraction of an hour to 36 hours. The magnetic material is then annealed at a temperature of about 550° C. to 650° C. for a fraction of an hour to 2 hours.

10 Claims, No Drawings