



(12) **United States Patent**
Nagata et al.

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- (54) **SPUTTERING TARGET AND ITS MANUFACTURING METHOD**
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- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.
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- (51) **Int. Cl.**⁷ **C22C 32/00**; C22C 1/00; C22C 14/34; B22F 1/00
- (52) **U.S. Cl.** **419/26**; 420/540; 148/514; 419/6; 419/10; 419/66; 204/298.13
- (58) **Field of Search** 204/298.13; 148/301, 148/514; 420/416, 590; 419/66, 6, 10, 26

- (56) **References Cited**
U.S. PATENT DOCUMENTS
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Primary Examiner—Steven H. VerSteeg
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(57) **ABSTRACT**

An ingot is made from a used target of 30 weight % or more, and new metals of the same components, and recycled alloy powder is made by a gas atomizing process. Magnetic permeability is controlled not to exceed 2 by adjusting the content of rare earth metals in rare earth alloy powder to be at least 35 weight %. By blending the recycled alloy powder with other powder to produce alloy powder containing at least 50 weight % of rare earth alloy powder having a magnetic permeability not higher than 2 and containing at least 65 weight % of rare earth alloy powder. By sintering the alloy powder under pressure and thereafter cutting top, bottom and side surfaces of the sintered material, a target having a magnetic permeability not higher than 2 and having a thickness not less than 8 mm is fabricated.

9 Claims, 5 Drawing Sheets

Fig. 1

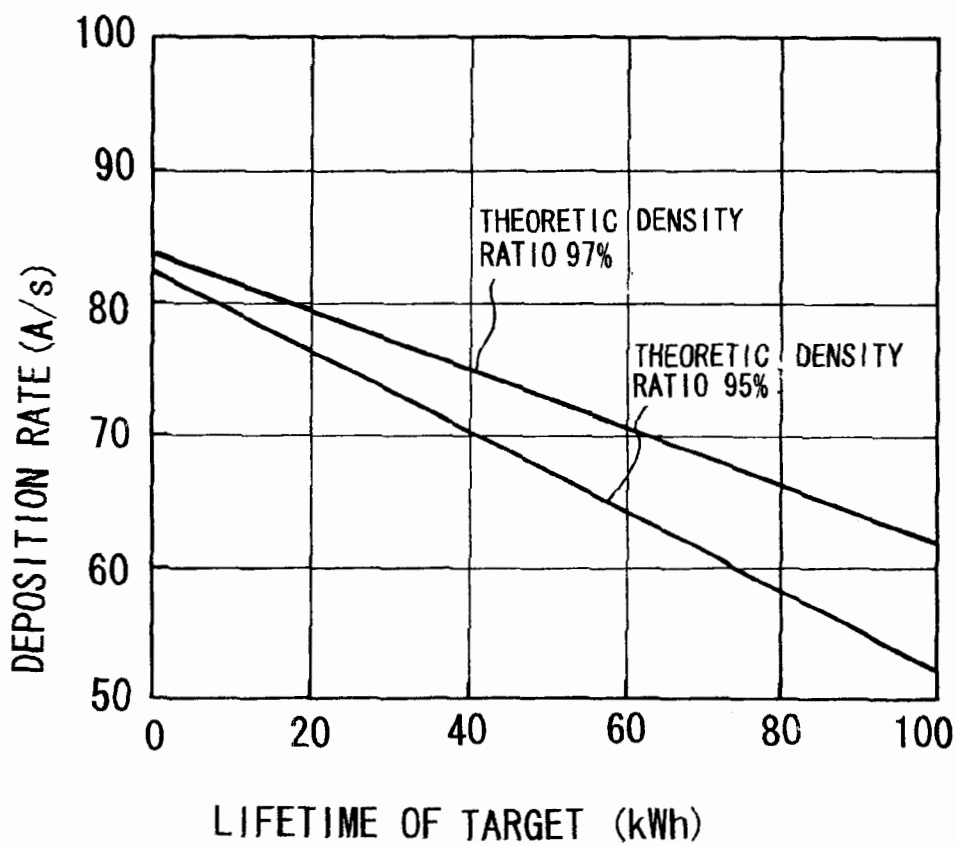


Fig. 2

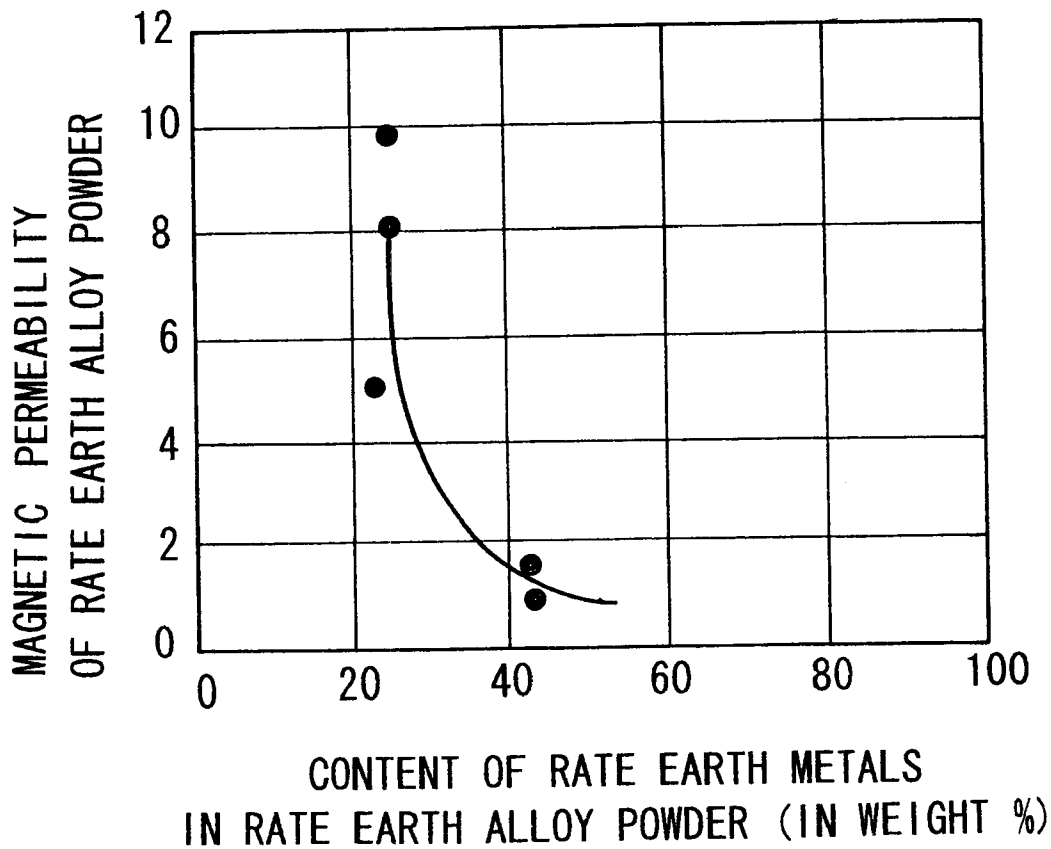


Fig. 3

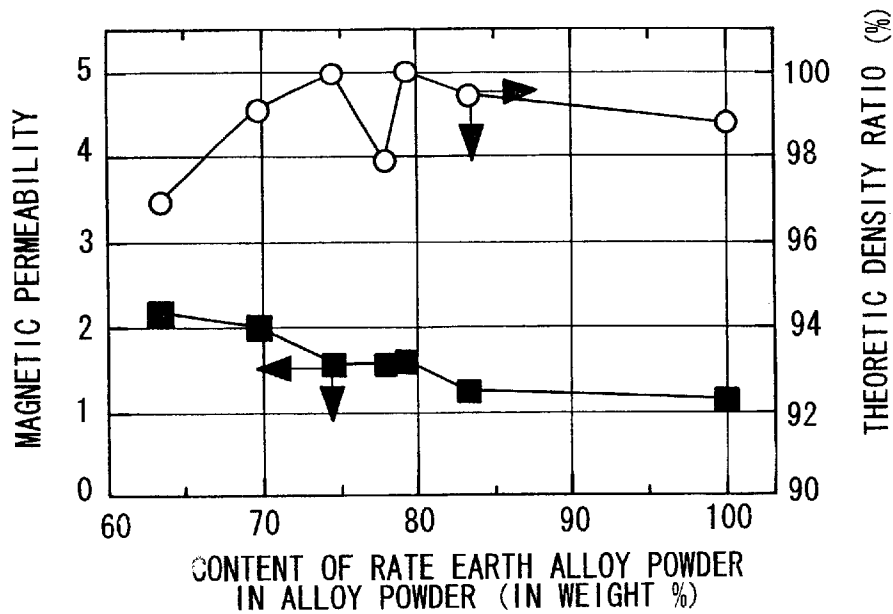


Fig. 4

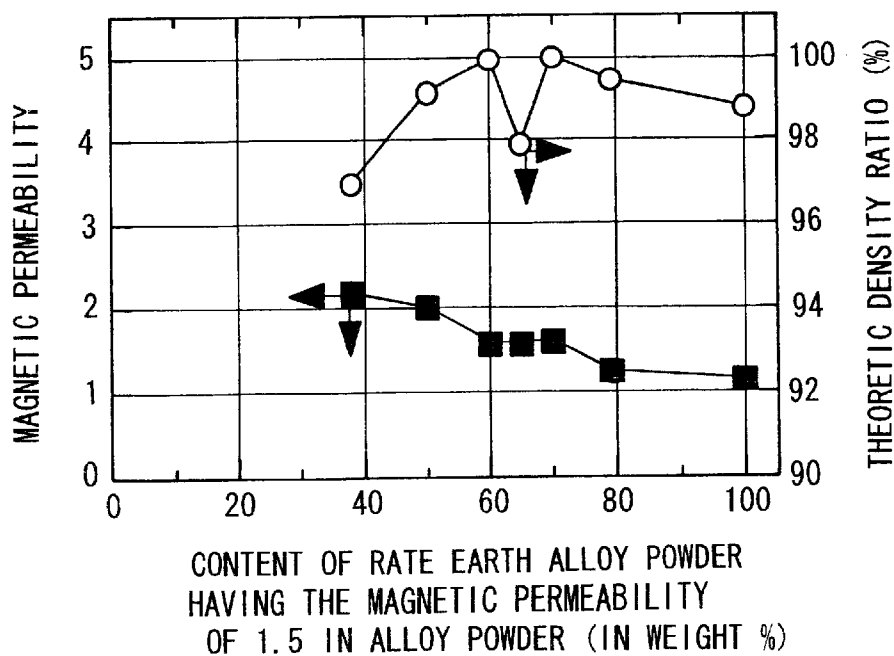
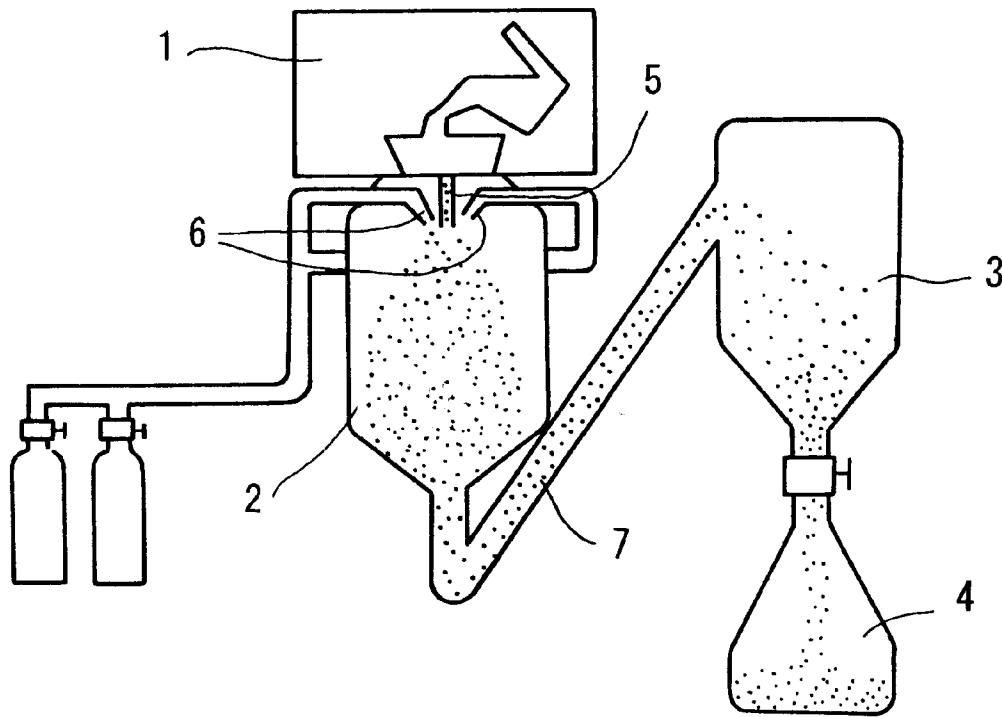


Fig. 5



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