



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

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- (54) **SPUTTERING TARGET AND ITS MANUFACTURING METHOD**
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- (73) Assignee: **Sony Corporation**, Tokyo (JP)
- (\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.
- (21) Appl. No.: **09/666,241**
- (22) Filed: **Sep. 21, 2000**
- (30) **Foreign Application Priority Data**  
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- (51) **Int. Cl.**<sup>7</sup> ..... **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

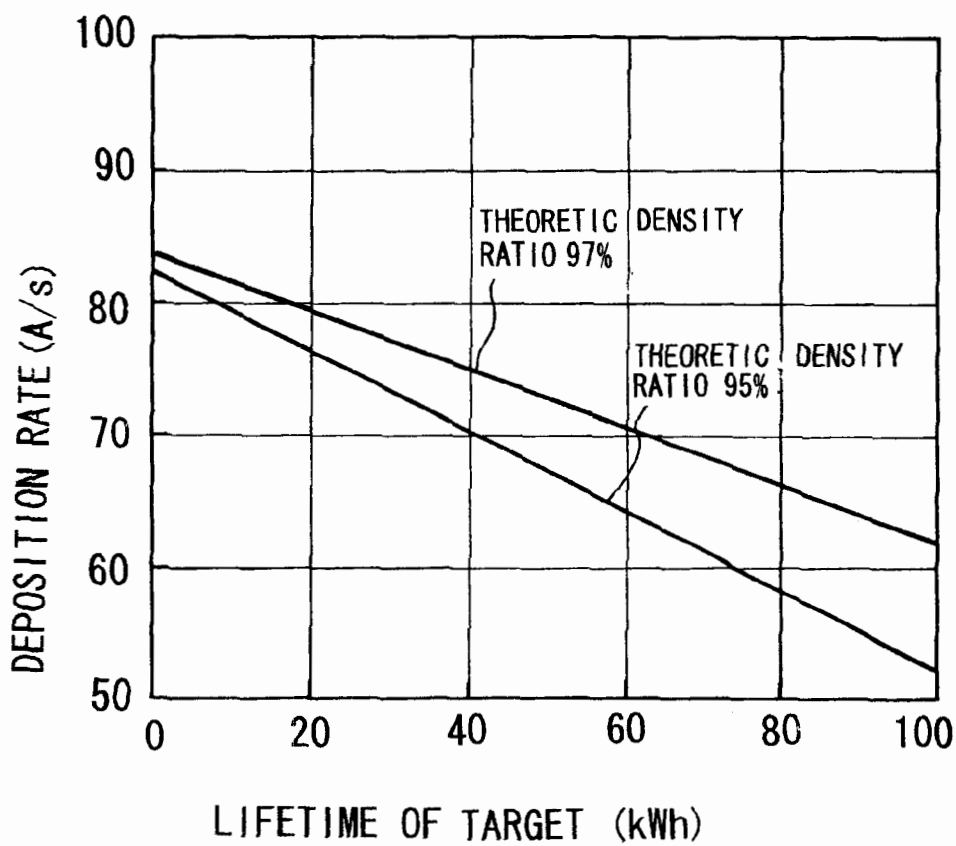
- (56) **References Cited**  
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\* cited by examiner  
*Primary Examiner*—Steven H. VerSteeg  
(74) *Attorney, Agent, or Firm*—Sonnenschein, Nath & Rosenthal

(57) **ABSTRACT**

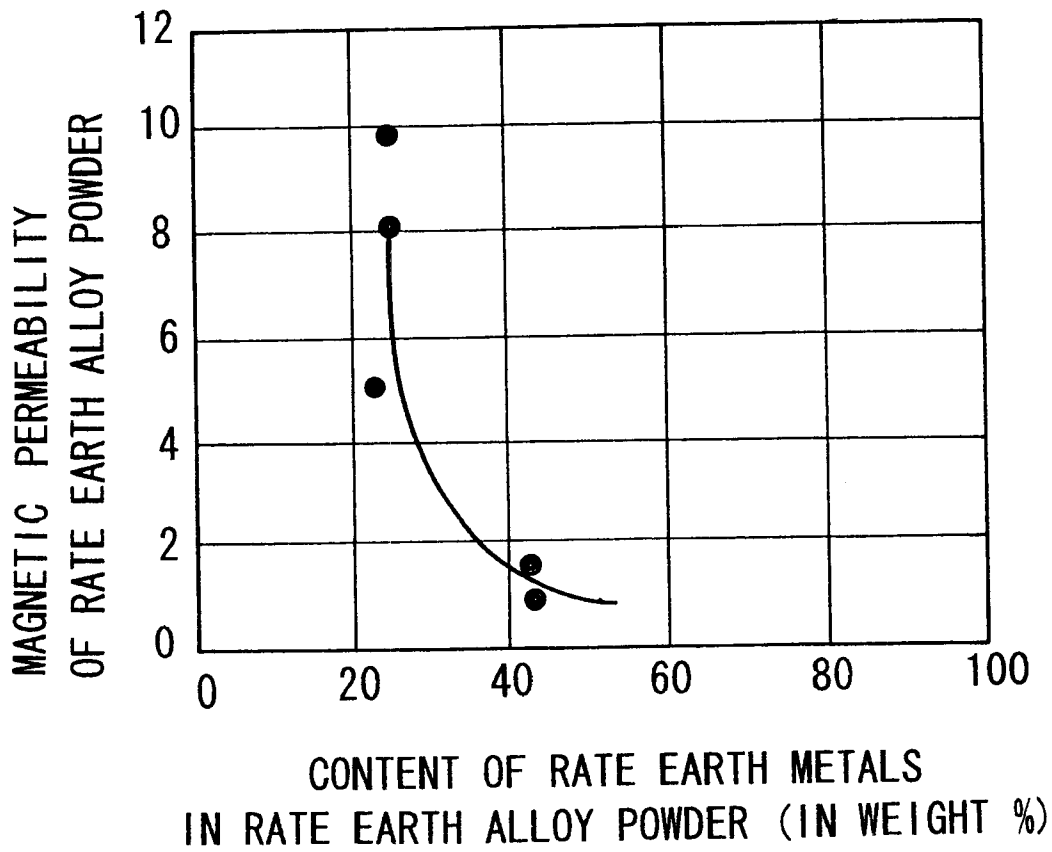
An ingot is made from a used target of 30 weight % or more, and new metals of the same components, and recycled alloy powder is made by a gas atomizing process. Magnetic permeability is controlled not to exceed 2 by adjusting the content of rare earth metals in rare earth alloy powder to be at least 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**

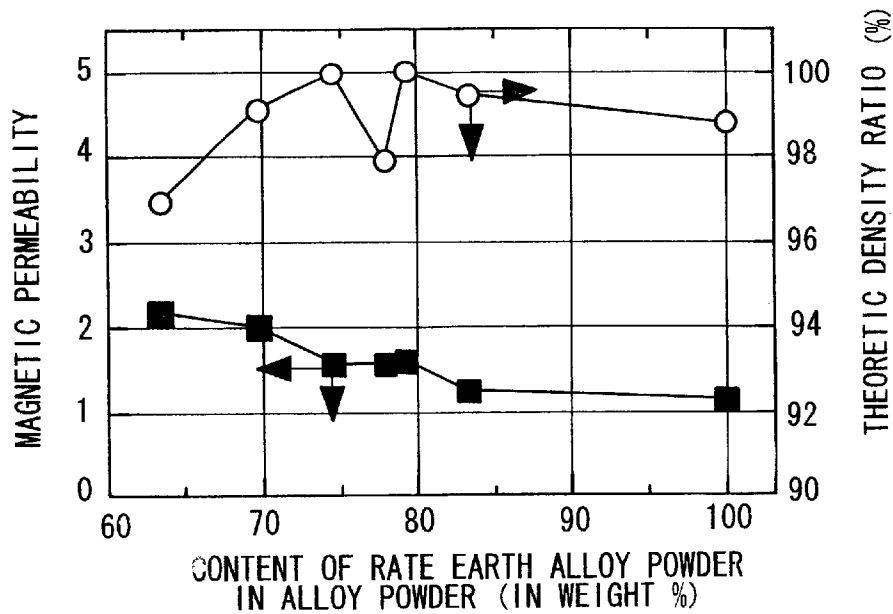
**Fig. 1**



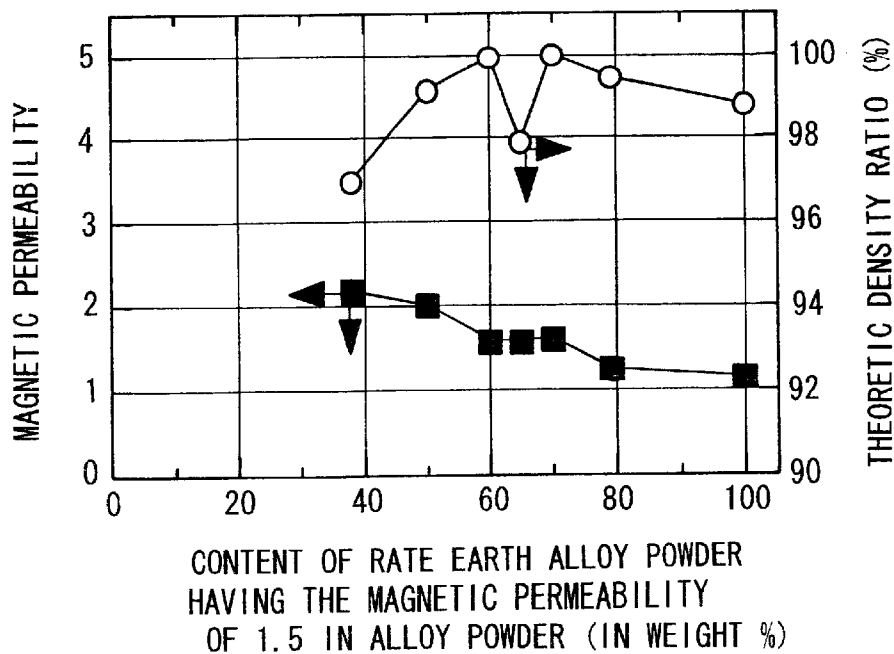
*Fig. 2*



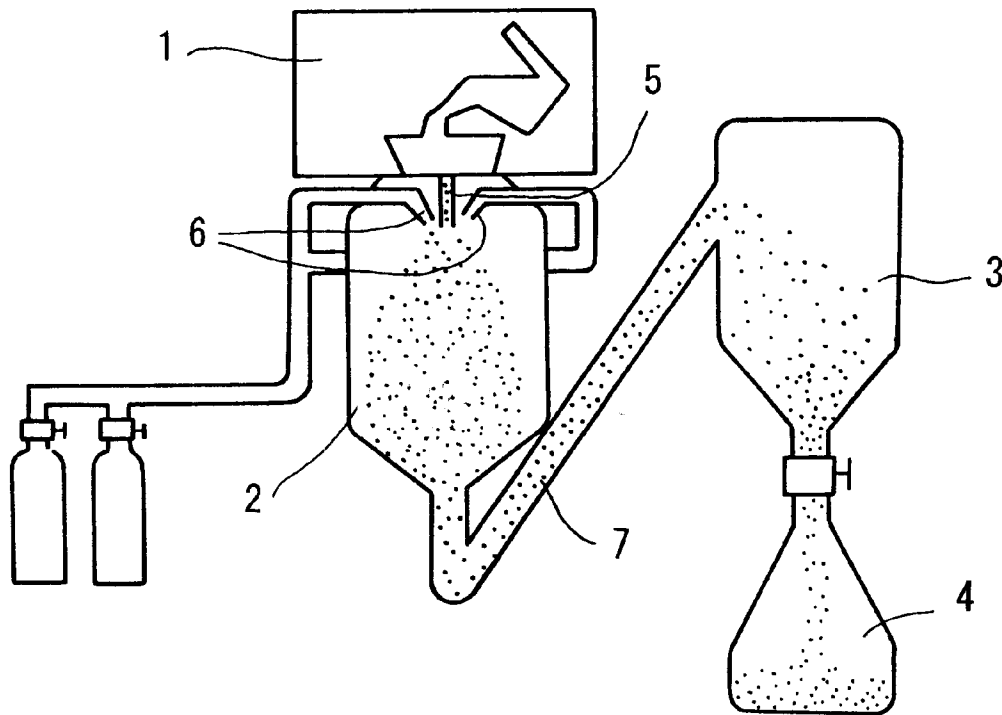
*Fig. 3*



*Fig. 4*



*Fig. 5*



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