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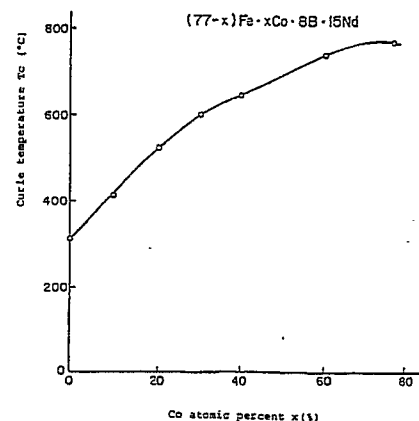
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(54) Permanent magnets.

(57) Permanent magnet materials, produced according to the following steps:
forming an alloy powder having a mean particle size of 0.3-80 μm and composed of, in atomic percentage, 8-30 % R (provided that R is at least one of rare earth elements including Y), 2-28 % B, and the balance Fe and inevitable impurities,
sintering the formed body at a temperature of 900-1200 °C,
subjecting the sintered body to a primary heat treatment at a temperature of 750-1000 °C,
then cooling the resultant body to a temperature of no higher than 680 °C at a cooling rate of 3-2000 °C/min, and
further subjecting the thus cooled body to a secondary heat treatment at a temperature of 480-700 °C.
Magnets having an energy product (BH)_{max} of at least 20 MGOe and a coercitive force (iH_c) of at least 10 kOe or magnets having an energy product (BH)_{max} of 40 MGOe or more can be obtained by

specific compositions.

Fig. 1



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EUROPEAN SEARCH REPORT

Application Number

EP 89 11 1005

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
P,X	EP-A-0 106 948 (SUMITOMO SPECIAL METALS CO., LTD) * Claims 1-5,11-15,17; abstract; page 18, line 20 - page 19, line 13; table 1, no. 19; table 2, nos. 29,51,71,81; table 4, nos. 20,21,49 * ---	1,3,5,7,9	H 01 F 1/08 B 22 F 3/24 C 22 C 1/04
P,X	EP-A-0 125 347 (SUMITOMO SPECIAL METALS CO., LTD) * Claims 1-4,13-21 * ---	1	
P,X	EP-A-0 126 179 (SUMITOMO SPECIAL METALS CO., LTD) * Claims 1,2,4,9,18-22,25-28 * ---	1	
P,X D	EP-A-0 126 802 (SUMITOMO SPECIAL METALS CO., LTD) * Claims 1,2,31-39 * ---	1	
A	EP-A-0 046 075 (FUJITSU LTD) * Claims 1,5; abstract * -----	1,3,5,7,9-14	TECHNICAL FIELDS SEARCHED (Int. Cl.4) H 01 F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10-07-1991	Examiner VITZTHUM N.A.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document			



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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

X

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims 1,2: Magnet of a first composition.
2. Claims 3,4: Magnet of a second composition.
3. Claims 5,6: Magnet of a third composition.
4. Claims 7,8: Magnet of a fourth composition.
5. Claims 9-14: Magnet of a fifth composition.

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims: