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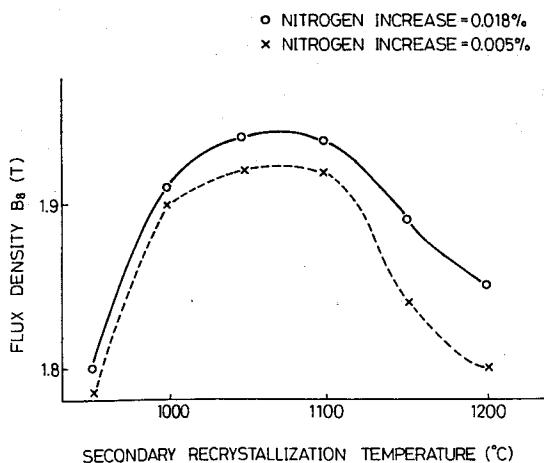
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㉒ Process for producing grain-oriented electrical steel sheet having high magnetic flux density.

㉓ A process for producing a grain-oriented electrical steel sheet having a high magnetic flux density, comprising the steps of: heating a steel slab comprising 1.8 to 4.8 wt% Si, 0.012 to 0.050 wt% acid-soluble Al, 0.010 wt% or less N, and the balance consisting of Fe and unavoidable impurities, to a temperature for hot rolling; hot-rolling the heated slab to form a hot-rolled strip; cold-rolling the hot-rolled strip to a final product sheet thickness at a final cold rolling reduction of 80% or more by a single step of cold rolling or by two or more steps of cold rolling with an intermediate annealing step inserted therebetween; primary-recrystallization-annealing the cold-rolled strip; final-annealing the primary-recrystallization-annealed strip so that secondary-recrystallized grains substantially completely grow up in a temperature region of from 1000 to 1100 °C and then purification is effected above 1100 °C; and subjecting the primary-recrystallization-annealed steel strip to a nitriding treatment before a secondary recrystallization occurs during the final annealing.

Fig. 1





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EUROPEAN SEARCH REPORT

Application Number

EP 90 10 6018

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.5)
X	EP-A-0 307 905 (NIPPON STEEL) * claims 1,3; figure 1 *	1	C21D8/12
A	EP-A-0 098 324 (NIPPON STEEL) * claim 1 *	1	
A	EP-A-0 219 611 (NIPPON STEEL) * claim 1 *	1	
D	& JP-B-62 045 285 (...)	1	
A	US-A-2 867 559 (J. E. MAY) * claim 1 *	1	
A	PATENT ABSTRACTS OF JAPAN vol. 9, no. 82 (C-275)(1805) 11 April 1985 & JP-A-59 215 419 (SHIN NIPPON SEITETSU) 5 December 1984 * abstract *	1	
A	PATENT ABSTRACTS OF JAPAN vol. 12, no. 84 (C-482) 17 March 1988 & JP-A-62 222 024 (NIPPON STEEL) 30 September 1987 * abstract *	1	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			C21D
<p>The present search report has been drawn up for all claims</p>			
Place of search	Date of completion of the search	Examiner	
BERLIN	23 JULY 1992	SUTOR W.	
CATEGORY OF CITED DOCUMENTS		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	
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			