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(54) Title: IRON-BASED GEAR WHEELS PRODUCED BY A PROCESS COMPRISING UNIAXIALLY COMPACTING, SINTERING AND SURFACE DENSIFYING

(57) Abstract: A powder metal toothed part and a method of producing a toothed sintered metal part by uniaxially compacting an iron or iron- based powder having coarse particles in a single compaction step, subjecting the part to sintering, and subjecting the part to a surface densifying process.

WO 2005/113178 A3

INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
B22F3/12 B22F3/10 B22F3/02 C22C33/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B22F C22C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2004/037467 A (HOEGANAES AB; KEJZELMAN, MIKHAIL; SKOGLUND, PAUL; VIDARSSON, HILMAR; K) 6 May 2004 (2004-05-06) abstract; claims 7,11,14 page 5, paragraph 5 - page 7, paragraph 2	1-9, 14-16,18
Y		10-13,17
Y	WO 94/14557 A (STACKPOLE LIMITED; JONES, PETER; BUCKLEY-GOLDER, KEITH) 7 July 1994 (1994-07-07) abstract; claims 10,12,14	10,12,13
Y	PATENT ABSTRACTS OF JAPAN vol. 015, no. 337 (C-0862), 27 August 1991 (1991-08-27) & JP 03 130349 A (SUMITOMO ELECTRIC IND LTD), 4 June 1991 (1991-06-04) abstract	11,17
	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	von Zitzewitz, A

2

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International Application No
/US2005/016594

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 171 546 B1 (MAARS OWE ET AL) 9 January 2001 (2001-01-09) abstract; claim 1 column 3, line 7 - line 19 column 3, line 55 - line 67	1-18
A	US 5 729 822 A (SHIVANATH ET AL) 17 March 1998 (1998-03-17) abstract column 3, line 40 - line 65	1-18
E	WO 2005/102565 A (HOEGANAES AB 'SE!; SKOGLUND PAUL 'SE!; KEJZELMAN MIKHAIL 'SE!; BERGMAR) 3 November 2005 (2005-11-03) the whole document	1-18

2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US2005/016594

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2004037467 A	06-05-2004	AU 2003269785 A1	13-05-2004
		BR 0314361 A	19-07-2005
		CA 2497383 A1	06-05-2004
		EP 1554070 A1	20-07-2005
WO 9414557 A	07-07-1994	NONE	
JP 03130349 A	04-06-1991	NONE	
US 6171546 B1	09-01-2001	AU 3200797 A	07-01-1998
		BR 9709713 A	10-08-1999
		CA 2258161 A1	18-12-1997
		CN 1222105 A	07-07-1999
		DE 69720532 D1	08-05-2003
		DE 69720532 T2	06-11-2003
		EP 0958077 A1	24-11-1999
		ES 2196338 T3	16-12-2003
		JP 2000511975 T	12-09-2000
		KR 2000016644 A	25-03-2000
		RU 2181317 C2	20-04-2002
		WO 9747418 A1	18-12-1997
US 5729822 A	17-03-1998	AU 2882697 A	05-01-1998
		CA 2255643 A1	04-12-1997
		WO 9745219 A1	04-12-1997
		EP 0906164 A1	07-04-1999
		JP 2000510909 T	22-08-2000
WO 2005102565 A	03-11-2005	NONE	