

1) Family number: 54629006 (US2015037610A)

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Title: COLD-ROLLED STEEL SHEET AND PROCESS FOR MANUFACTURING SAME

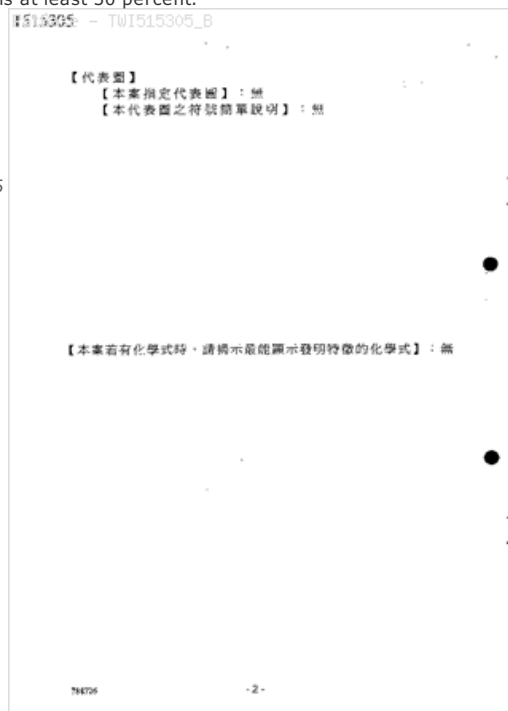
Abstract: A high-strength cold-rolled steel sheet includes a composition having controlled amounts of carbon, silicon, manganese, phosphorous, sulfur, titanium, niobium, sol. Aluminum, chromium, molybdenum, vanadium, boron, calcium, REM, and iron. A microstructure thereof has a main phase of ferrite of at least 40 area percent, and a second phase of a low-temperature transformation phase consisting either or both of martensite and bainite, which comprises at least 10 area percent in total and retained austenite (gamma) at least comprising 3 area percent. An average grain diameter of ferrite has a tilt angle of at least 15 degrees is at most 5.0 mm, an average grain diameter of the low-temperature transformation-produced phase is at most 2.0 mm, an average grain diameter of lump-like retained gamma having an aspect ratio of less than 5 is at most 1.5 mm, and an area fraction of the lump-like retained gamma relative to the retained gamma is at least 50 percent.

Classifications:

International (IPC 8-9): B21B3/00 C21D8/02 C21D9/46 C22C38/00 C22C38/02 C22C38/04 C22C38/06 C22C38/12 C22C38/14 C22C38/18 C22C38/26 C22C38/38 C22C38/60 (Advanced/Invention); C22C38/00 (Core/Invention)

International (IPC 1-7): B21B3/00 C21D9/46 C22C38/00 C22C38/60
CPC: C22C38/38 C22C38/26 C21D8/0236 C21D2211/001 C21D2211/002 C21D2211/005 C21D2211/008 C22C38/002 C22C38/005 C22C38/02 C22C38/04 C22C38/06 C22C38/12 C22C38/14 C21D8/0284 C21D8/0205 C22C38/00 C22C38/18 Y10T428/12972 C21D8/0226 C21D9/46 C21D8/0263

US: 148/320 148/330 148/331 148/333 148/337 148/504 148/537 148/603 148/645 428/684



Family:

Publication number	Publication date	Application number	Application date
BR112014020567 A2	20170822	BR20141120567	20130213
BR112014020567 B1	20190326	BR20141120567	20130213
CN104245988 A	20141224	CN201380021320	20130213
CN104245988 B	20160706	CN201380021320	20130213
DE602013036904 D1	20180530	DE201360036904T	20130213
EP2818569 A1	20141231	EP20130752393	20130213
EP2818569 A4	20151230	EP20130752393	20130213
EP2818569 B1	20180502	EP20130752393	20130213
ES2673111 T3	20180619	ES20130752393T	20130213
ID201601538 A	20160318	ID2014P0005597	20130213
IN07404DN2014 A	20150424	IN2014DN07404	20140903
JP2013125400 A1	20150730	JP20130528456T	20130213
JP5590244 B1	20140917	JP20130528456T	20130213
KR101609969 B1	20160406	KR20147026111	20130213
KR20140129209 A	20141106	KR20147026111	20130213
MX2014009994 A1	20150220	MX20140009994	20130213
MX356409 B	20180524	MX20140009994	20130213
PL2818569 T3	20180928	PL20130752393T	20130213
TH149406 A	20160426	TH20141004818	20130213
TW201400626 A	20140101	TW20130106032	20130221
TWI515305 B	20160101	TW20130106032	20130221
US2015037610 AA	20150205	US20130379829	20130213
US2017121788 AA	20170504	US20170407347	20170117
US9580767 BB	20170228	US20130379829	20130213
WO13125400 A1	20130829	WO2013JP53313	20130213

Priority:

JP20120036475 20120222 EP20130752393 20130213 WO2013JP53313 20130213
JP20130528456 20130213 US20140379829 20140820 US20170407347 20170117

Probable Assignee: NIPPON STEEL AND SUMITOMO METAL CORP**Assignee(s):** (std): NIPPON STEEL AND SUMITOMO METAL ; NIPPON STEEL AND SUMITOMO METAL CORP**Assignee(s):** NIPPON STEEL AND SUMITO METAL CORP**Inventor(s):** (std): HAGA JUN ; HATA KENGO ; IMAI NORIO ; NISHIO TAKUYA ; TOMIDA TOSHIRO ; TOSHIRO TOMIDA ; TAKUYA NISHIO ; NORIO IMAI ; KENGO HATA ; JUN HAGA ; HAGAJUN**Agent(s):** ZIMMERMANN AND PARTNER PATENTANWALTE MBB; ZIMMERMANN AND PARTNER; ELZABURU SLP
ELZABURU SLP; ARIFIA JAUHARIA FAJRA ST SH; CLARK AND BRODY; HIROSE SHOICHI**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW**2) Family number: 31170064** (US2006134452A)

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Title: HIGH STRENGTH AND HIGH MAGNETIC PERMEABILITY STEEL SHEET FOR CATHODE RAY TUBE BAND AND METHOD FOR PRODUCTION THEREOF

Abstract: A high-strength, high-permeability steel sheet for picture tube band comprises, in mass percent, C: 0.003-0.010 percent, Si: 0.5-1.0 percent, Mn: 1.0-2.0 percent, P: 0.04-0.15 percent, S: not more than 0.02 percent, Al: not more than 0.030 percent, N: not more than 0.004 percent and the balance of Fe and unavoidable impurities, has a chemical composition satisfying $CxMnP$ greater than or equal to 2.5×10^{-4} , and has a ferrite crystal grain diameter of 10-100 μm and a yield stress of 300 N/mm² or higher, and preferably has a specific permeability $\mu_0.35$ in a DC magnetic field of 0.35 Oe of 400 or higher. The steel sheet can be produced by regulating the hot-rolling coiling temperature to 600-700 degrees centigrade and selecting an appropriate combination of the cold rolling reduction ratio and a final annealing temperature in the range of 750-900 degrees centigrade

Classifications:**International (IPC 8-9):** B21B3/00 B32B15/10 C21D8/12 C21D9/46 C22C38/00 C22C38/06 C23C2/06 C23C2/12 C23C2/40 C25D5/26 H01F1/147 H01F1/16 (Advanced/Invention);

C21D8/12 C21D9/46 C22C38/00 C22C38/06 (Advanced/Non-invention);

B21B3/00 B32B15/10 C21D8/12 C21D9/46 C22C38/00 C22C38/06 C23C2/04 C23C2/06 C23C2/36 C25D5/26

H01F1/12 (Core/Invention)

International (IPC 1-7): B21B3/00 C21D8/12 C21D9/46 C22C38/00 C22C38/06 C23C2/06 C23C2/12 C23C2/40 C25D5/26 H01F1/16**CPC:** Y10T428/12757 Y10T428/12799 C22C38/02 C21D8/1261 C22C38/04 C22C38/06 C23C2/02 C25D5/36**European:** C21D8/12F6 C22C38/02 C22C38/04 C22C38/06 C23C2/02 C25D5/36**US:** 148/111 148/120 148/307 148/320 148/531 148/533 148/603 420/8 428/653 428/659**Family:**

Publication number	Publication date	Application number	Application date
 CN1756854 A	20060405	CN200480006131	20040412
 JP2004315883 A2	20041111	JP20030110771	20030415
 KR20060008892 A	20060127	KR20057019558	20040412
 US2006134452 AA	20060622	US20050552350	20051007
 US7501029 BB	20090310	US20050552350	20051007
 WO04092433 A1	20041028	WO2004JP05207	20040412

Priority:

JP20030110771 20030415 WO2004JP05207 20040412

Probable Assignee: NISSHIN STEEL CO LTD**Assignee(s):** (std): HIGO YUICHI ; HIRATA KENTARO ; NISSHIN STEEL CO LTD ; SUZAKI TSUNETOSHI**Assignee(s):** NISSHINSEIKOUKABUSHIKIGAISHA ; N A ; NISSHIN STEEL CO**Inventor(s):** (std): HIGO YUICHI ; HIRATA KENTARO ; SUZAKI TSUNETOSHI ; YUICHI SUZAKI TSUNETOSHI HIRAT**Inventor(s):** SUZAKI TSUNETOSHI HIRATA KENTARO HIGO YUICHI**Agent(s):** HAGIWARA YASUSHI; CLARK AND BRODY**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT KE KG KP KR KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW**3) Family number: 42164109** (US2010221572A)

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Title: STEEL, FOR HOT FORMING OR QUENCHING IN A TOOL, HAVING IMPROVED DUCTILITY

Abstract: The invention relates to a steel part, the composition of the steel of which comprises, the contents being expressed by weight: 0.040 percent ?C?0.100 percent; 0.80 percent ?Mn?2.00 percent; Si?0.30 percent; S?0.005 percent; P?0.030 percent; 0.010 percent S?Al?0.070 percent; 0.015 percent ?Nb?0.100 percent; 0.030 percent Ti?0.080 percent; N?0.009 percent; Cu?0.100 percent; Ni?0.100 percent; Cr?0.100 percent; Mo?0.100 percent; and Ca?0.006 percent, the balance of the composition consisting of iron and inevitable impurities resulting from the smelting, the microstructure of the steel consisting of at least 75 percent equiaxed ferrite, martensite in an amount not less than 5 percent but not exceeding 20 percent, and bainite in an amount not exceeding 10 percent.

Classifications:

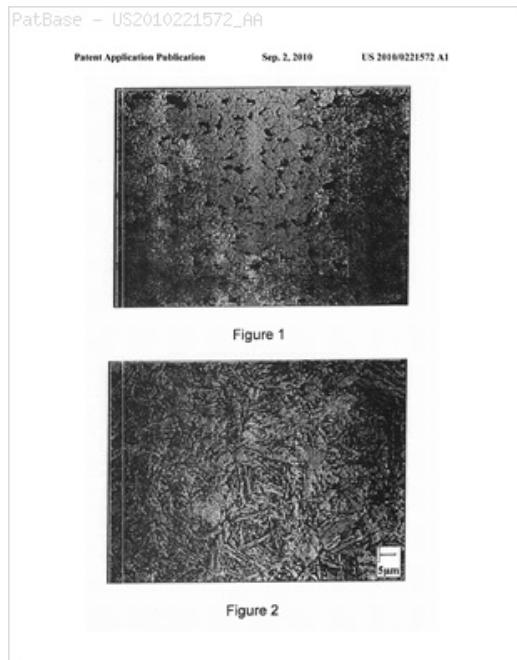
International (IPC 8-9): B21D22/20 B32B15/01 B32B15/04 B32B15/18 B32B15/20 C21D1/18 C21D1/673 C21D1/68 C21D6/00 C21D7/13 C21D8/02 C21D8/04 C21D9/00 C21D9/48 C22C38/00 C22C38/02 C22C38/04 C22C38/06 C22C38/12 C22C38/14 C22C38/38 C22C38/42 C22C38/58 C23C2/02 C23C2/06 C23C2/12 C23C2/26 C23C2/28 C23F17/00 (Advanced/Invention); C21D1/68 (Advanced/Non-invention); B21D22/20 B32B15/01 B32B15/18 B32B15/20 C21D1/18 C21D6/00 C21D7/00 C21D8/02 C21D8/04 C21D9/00 C21D9/48 C22C C22C38/00 C22C38/02 C22C38/04 C22C38/06 C22C38/12 C22C38/14 C22C38/38 C22C38/42 C22C38/58 C23C2/02 C23C2/04 C23C2/06 C23F17/00 (Core/Invention); C21D C22C C23C C23F (Subclass/Invention)

International (IPC 1-7): C21D1/18 C21D6/00 C21D7/13 C21D8/02 C21D8/04 C21D9/48 C22C C22C38/00 C22C38/02 C22C38/04 C22C38/06 C22C38/12 C22C38/14 C22F17/00 C23C2/06 C23C2/11 C23C2/12 C23F17/00

CPC: B32B15/012 B32B15/013 C21D1/68 C21D6/005 C21D8/0205 C21D8/0405 C21D8/0478 C21D9/48 C21D2211/002 C21D2211/005 C21D2211/008 C22C38/12 C22C38/14 C23C2/06 C23C2/12 C23C2/26 C23C2/28 C21D8/0263 Y10T428/12757 Y10T428/12799 Y10T428/12972 C21D1/18 C21D7/13 C21D8/0278 C22C38/04 C22C38/06 C23C2/02

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US: 148/320 148/332 148/332S 148/333 148/333S 148/531 148/531S 148/533 148/533S 148/645 148/651 148/651S 428/653 428/653P 428/659 428/659S 428/684 428/684S



Family:

Publication number	Publication date	Application number	Application date
AR065764 AA	20090701	AR2008P101077	20080314
AT556152 E	20120515	AT20080775621T	20080303
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BRPI0809006 B1	20171121	BR2008PI09006	20080303
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CN101631880 B	20120704	CN200880007891	20080303
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IN277620 B	20161202	IN2009CN05359	20090911
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KR20170038119 A	20170405	KR20177008499	20080303
KR20180122489 A	20181112	KR20187032044	20080303
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TH101015 A	20100423	TH20081001218	20080312
UA99127 C2	20120725	UA20090100344	20080303
US2010221572 AA	20100902	US20080530791	20080303
US2014216612 AA	20140807	US20140249902	20140410
US8722203 BB	20140513	US20080530791	20080303
US9611517 BB	20170404	US20140249902	20140410
WO08110670 A1	20080918	WO2007FR00441	20070314
WO08132303 A1	20081106	WO2008FR00278	20080303
ZA200905998 A	20100428	ZA20090005998	20090827

Priority:

WO2007FR00441 20070314 EP20080775621 20080303 WO2008FR00278 20080303
US20100530791 20100330 US20140249902 20140410

Probable Assignee: ARCELORMITTAL FRANCE

Assignee(s): (std): ARCELORMITTAL FRANCE ; ARCELORMITTAL FRANCE FR ; ARSELORMITTAL FRANS ; LAURENT JEAN PIERRE ; MALOT THIERRY

Inventor(s): (std): JEAN PIERRE LAURENT ; LAURENT JEAN PIERRE ; MALOT THIERRY ; THIERRY MALOT ; MALOT T ERRI ; LORAN ZHAN P ER

Inventor(s): MALOT T'ERRI ; LORAN ZHAN-P'ER

Agent(s): NORTON ROSE CANADA SENCRL SRL LLP; PLAISANT SOPHIE MARIE; KANAYAMA MASATAKA; TSUBOKURA MICHIAKI; OSAKI KATSUMASA; KAWAGUTI AND PARTNERS; ONO MAKOTO; OBLON SPIVAK MCCLELLAND MAIER AND NEUSTADT LLP; DAVIDSON DAVIDSON AND KAPPEL LLC; PLAISANT SOPHIE

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

4) Family number: 54121274 (US2014366994A)

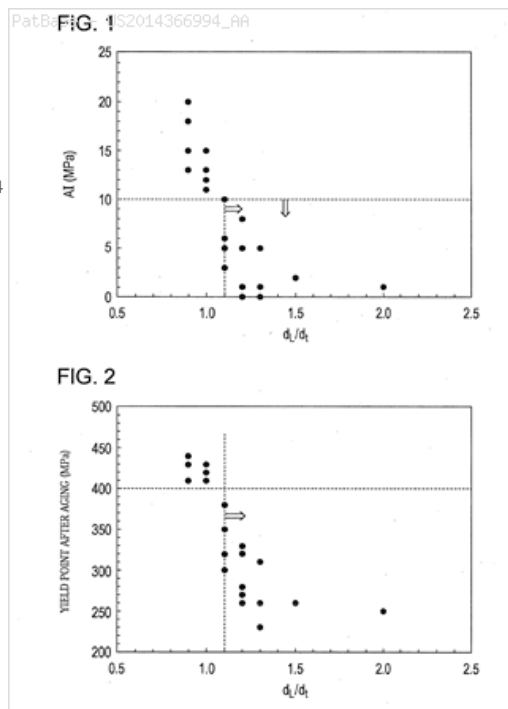
PatBase

Title: STEEL SHEET WITH EXCELLENT AGING RESISTANCE PROPERTY AND METHOD FOR PRODUCING THE SAME

Abstract: A steel sheet and a method for producing the same are disclosed. The steel sheet has a composition containing 0.015 percent to 0.05 percent C, less than 0.10 percent Si, 0.1 percent to 2.0 percent Mn, 0.20 percent or less P, 0.1 percent or less S, 0.01 percent to 0.10 percent Al, 0.005 percent or less N, and 0.06 percent to 0.5 percent Ti in percent by mass, C and Ti satisfying the inequality $Ti \geq 4 \cdot C$, where Ti (mass percent) = $Ti - 3.4N$ and Ti , C , and N represent the content (mass percent) of each element. The steel sheet has a microstructure which contains a ferrite phase as a base, in which the average grain diameter of the ferrite phase is 7 micro m or more, and in which the ratio of the rolling-direction average grain diameter to thickness-wise average grain diameter of the ferrite phase is 1.1 or more.

Classifications:

International (IPC 8-9): C21D8/02 C21D9/46 C22C38/00 C22C38/02 C22C38/04 C22C38/06 C22C38/12 C22C38/14 C22C38/22 C22C38/24 C22C38/26 C22C38/28 C22C38/42 C22C38/44 C22C38/46 C22C38/48 C22C38/50 C22C38/54 C22C38/58 C22C38/60 (Advanced/Invention); C21D9/46 C22C38/00 C22C38/14 C22C38/58 (Core/Invention)
CPC: C21D8/0236 C22C38/60 C22C38/54 C22C38/50 C22C38/48 C22C38/46 C22C38/44 C22C38/42 C22C38/28 C22C38/26 C22C38/24 C22C38/22 C21D8/0263 C22C38/001 C22C38/02 C22C38/12 C22C38/04 C22C38/14 C21D8/0205 C21D2211/004 C21D2211/005 C22C38/00 C22C38/002 C22C38/06 C21D9/46
US: 148/330 148/332 148/333 148/334 148/336 148/337 148/507



Family:

Publication number	Publication date	Application number	Application date
CN103998638 A	20140820	CN201280061358	20121210
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DE602012034076 D1	20170810	DE201260034076T	20121210
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JP2013088692 A1	20150427	JP20130549112T	20121210
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KR101650641 B1	20160823	KR20147017827	20121210
KR20140098218 A	20140807	KR20147017827	20121210
TH137993 A	20141118	TH20121006426	20121211
US2014366994 AA	20141218	US20120363977	20121210
US9828648 BB	20171128	US20120363977	20121210
WO13088692 A1	20130620	WO2012JP07870	20121210

Priority:

JP20110270937 20111212 EP20120858474 20121210 WO2012JP07870 20121210
JP20130549112 20121210

Probable Assignee: JFE HOLDINGS INC

Assignee(s): (std): JFE HOLDINGS INC ; JFE STEEL CORP ; KAWASAKI STEEL CO

Inventor(s): (std): FUJITA KOICHIRO ; KIZU TARO

Agent(s): GRUENECKER PATENT U RECHTSANWALTE PARTG MBB; GRUENECKER KINKELDEY STOCKMAIR AND SCHWANHAUSSER; RATNERPRESTIA; KUMASAKA AKIRA ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: LOW-DENSITY STEEL HAVING GOOD DRAWABILITY

Abstract: The invention relates to a hot-rolled ferritic steel sheet, the composition of the steel of which comprises, the contents being expressed by weight: 0.001?C?0.15 percent, Mn?1 percent, Si?1.5 percent, 6 percent ?Al?10 percent, 0.020 percent ?Ti?0.5 percent, S?0.050 percent, P?0.1 percent, and, optionally, one or more elements chosen from: Cr?1 percent, Mo?1 percent, Ni?1 percent, Nb?0.1 percent, V?0.2 percent, B?0.010 percent, the balance of the composition consisting of iron and inevitable impurities resulting from the smelting, the average ferrite grain size d_{IV} measured on a surface perpendicular to the transverse direction with respect to the rolling being less than 100 microns.

Classifications:

International (IPC 8-9): B21B1/26 B22D11/06 B62D25/00 B62D29/04 C21D6/00 C21D6/02 C21D8/02 C21D8/04 C21D9/46 C22C38/00 C22C38/02 C22C38/04 C22C38/06 C22C38/14 C22C38/44 C22C38/48 C22C38/50 C22C38/60 (Advanced/Invention); C21D6/00 (Advanced/Non-invention); B62D25/00 B62D29/00 C21D6/00 C21D8/02 C21D8/04 C21D9/46 C22C38/00 C22C38/04 C22C38/06 C22C38/14 C22C38/60 (Core/Invention); C21D6/00 (Core/Non-invention); C21D C22C (Subclass/Invention)

International (IPC 1-7): C21D6/00 C21D8/02 C21D8/04 C22C 38/00 C22C38/00 C22C38/04 C22C38/06

CPC: C21D2211/005 C22C38/004 C21D6/005 C21D8/021 C21D8/0226 C21D8/0236 C21D8/041 C21D8/0415 C21D8/0426 C21D8/0436 C22C38/06 C22C38/14 C21D9/46 C21D8/0247 C22C38/50 C22C38/48 C22C38/44 C22C38/04 C22C38/02 C22C38/002 C21D8/0215

European: C21D8/02B C21D8/02B2 C21D8/02D2 C21D8/02D6 C21D8/04B C21D8/04B2 C21D8/04D2 C21D8/04D6 C22C38/06 C22C38/14 M21D6/00H

US: 148/328 148/328S 148/335 148/547 148/621 148/621S 420/81 420/81S

PatBase - US2010300585_AA

Patent Application Publication Dec. 2, 2010 Sheet 1 of 3 US 2010/0300585 A1

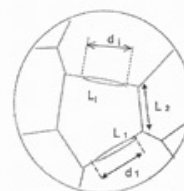


Figure 1

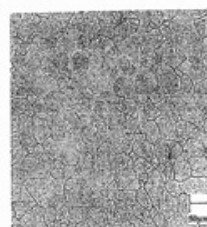


Figure 2

Family:

Publication number	Publication date	Application number	Application date
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EP2155916 B2	20150311	EP20080805524	20080429
ES2356186 T3	20110405	ES20080805524T	20080429
ES2356186 T5	20150619	ES20080805524T	20080429
IN06731CN2009 A	20100305	IN2009CN06731	20091116
JP2010526939 T2	20100805	JP20100507948T	20080429
JP2014040668 A2	20140306	JP20130206098	20131001
JP5552045 B2	20140716	JP20100507948T	20080429
JP5728547 B2	20150603	JP20130206098	20131001
KR101476866 B1	20141226	KR20097023754	20080429
KR20100019443 A	20100218	KR20097023754	20080429
KR20140129365 A	20141106	KR20147027952	20080429
MA31363 B1	20100503	MA20090032326	20091103
MX2009012221 A1	20091201	MX20090012221	20080429
RU2009146543 A	20110627	RU20090146543	20080429
RU2436849 C2	20111220	RU20090146543	20080429
TH105915 A	20110128	TH20081002400	20080514
TH59185 B	20171128	TH20081002400	20080514
UA99827 C2	20121010	UA20090102894	20080429
US2010300585 AA	20101202	US20080600085	20080429
US2017101694 AA	20170413	US20160374827	20161209
US9580766 BB	20170228	US20080600085	20080429
US9765415 BB	20170919	US20160374827	20161209
WO08145872 A1	20081204	WO2008FR00610	20080429

ZA200907619 A	20100526	ZA20090007619	20091030
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Priority:

EP20070290624 20070516 EP20080805524 20080429 JP20100507948 20080429
 JP20100507948T 20080429 WO2008FR00610 20080429 US20100600085 20100302
 US20160374827 20161209

Probable Assignee: ARCELOR MITTAL FRANCE

Assignee(s): (std): ARCELOMITTAL FRANCE ; ARSELOMITTAL FRANS ; BOUAZIZ OLIVIER ; GARAT XAVIER ; DRILLET JOSEE ; URIARTE JEAN LOUIS ; PERLADE ASTRID

Assignee(s): DRILLET JOSE ; ARCELOR MITTAL FRANCE

Inventor(s): (std): DRILLET JOSEE ; GARA KSAV E ; GARAT XAVIER ; JEAN LOUIS URIARTE ; JOSEE DRILLET ; JURIJART ZHAN LUI ; OLIVIER BOUAZIZ ; PERLADE ASTRID ; PERLADE ASTRID ; URIARTE JEAN LOUIS ; XAVIER GARAT ; IRIARTE JEAN LOUIS ; ASTRID PERLADE ; BOUAZIZ OLIVIER ; BOUAZIZ OLIV E ; DRIJE ZHOZE

Inventor(s): DRILLET JOSE

Agent(s): NORTON ROSE CANADA SENCRL SRL LLP; PLAISANT SOPHIE MARIE; DOMENEGO BERTRAND; CURELL MIREIA; TSUBOKURA MICHIAKI; OSAKI KATSUMASA; KAWAGUTI AND PARTNERS; OBLON SPIVAK MCCLELLAND MAIER AND NEUSTADT LLP; DAVIDSON DAVIDSON AND KAPPEL LLC; PLAISANT SOPHIE

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

6) Family number: 55807549 (JP2014015651A)

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Title: HIGH STRENGTH COLD ROLLED STEEL SHEET HAVING EXCELLENT DEEP DRAWABILITY AND METHOD FOR PRODUCING THE SAME

Abstract: PROBLEM TO BE SOLVED: To provide an advantageous method for producing a cold rolled steel sheet having excellent deep workability to a degree that satisfactory moldability can be realized in actual press molding, and an advantageous production method therefor.SOLUTION: The steel sheet has a composition comprising, by mass, 0.005 percent or less of C, 0.1 to 0.8 percent Si, 1.0 to 2.5 percent Mn, 0.1 percent or less of P, 0.02 percent or less of S, 0.01 percent or less of N and 0.1 percent or less of Al, and further comprising one or two kinds selected from 0.005 to 0.05 percent Ti and 0.01 to 0.08 percent Nb, and the balance Fe with inevitable impurities, and in which ferrite grain size is 7 micro m or higher, the ratio of the length between the rolling direction of ferrite grains and the sheet thickness direction is 2.5 percent or lower, and the ratio occupied by large-angle grain boundaries in which the orientation difference between two crystals including the grain boundaries among ferrite grain boundaries is 15 degrees or higher is 50 percent or higher of all the grain boundaries.

Classifications:

International (IPC 8-9): B21B3/00 B21B3/02 C21D8/04 C21D9/47 C21D9/48 C22C38/00 C22C38/12 C22C38/14 C22C38/38 C22C38/60 C23C30/00 (Advanced/Invention); C22C38/00 C23C30/00 (Core/Invention); C21D (Subclass/Invention)

Family:

Publication number	Publication date	Application number	Application date
BR102012028655 A2	20141216	BR20121028655	20121108
IN03165MU2012 A	20140307	IN2012MU03165	20121031
JP2014015651 A2	20140130	JP20120152840	20120706
RU2012147604 A	20140520	RU20120147604	20121108
RU2532563 C2	20141110	RU20120147604	20121108
TH137807 A	20141103	TH20121005833	20121108
ZA201208371 A	20130731	ZA20120008371	20121107

Priority:

JP20120152840 20120706

Probable Assignee: JFE HOLDINGS INC

Assignee(s): (std): JFE HOLDINGS INC ; JFE STEEL CORP ; KAWASAKI STEEL CO

Assignee(s): DZHFE STIL KORPOREJSHN

Inventor(s): (std): FUNAKAVA ESIMASA ; FUNAKAWA YOSHIMASA

Inventor(s): YOSHIMASA FUNAKAWA

7) Family number: 28179551 (US2002000266A)

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Title: High strength steel sheet and method for manufacturing the same

Abstract: The present invention relates to a high strength steel sheet consisting essentially of 0.04 to 0.1 percent C, 0.5 percent or less Si, 0.5 to 2 percent Mn, 0.05 percent or less P, 0.005 percent or less O, 0.005 percent or less S, by weight, having 10 mum or less of average ferritic grain size, and 20 mm/mm2 or less of generation frequency A, which generation frequency A is defined as the total length of a banded secondary phase structure observed per 1 mm2 of steel sheet cross section along the rolling direction thereof. The steel sheet is manufactured by, for example, a method comprising the steps of: hot-rolling a continuously cast slab having the composition described above at temperatures of Ar3 transformation point or above directly or after reheating thereof; and cooling the hot-rolled steel sheet within 2 seconds down to the temperatures of from 600 to 750 degrees centigrade at cooling speeds of from 100 to 2,000 degrees centigrade /sec, followed by coiling the cooled steel sheet at temperatures of from 450 to 650 degrees centigrade The present invention provides a high strength steel sheet having strengths of 340 MPa or more and having excellent stretch flanging performance, ductility, and shock resistance, providing a sufficient coil shape with good surface properties, even when hot dip zinc-coating is applied.

Classifications:

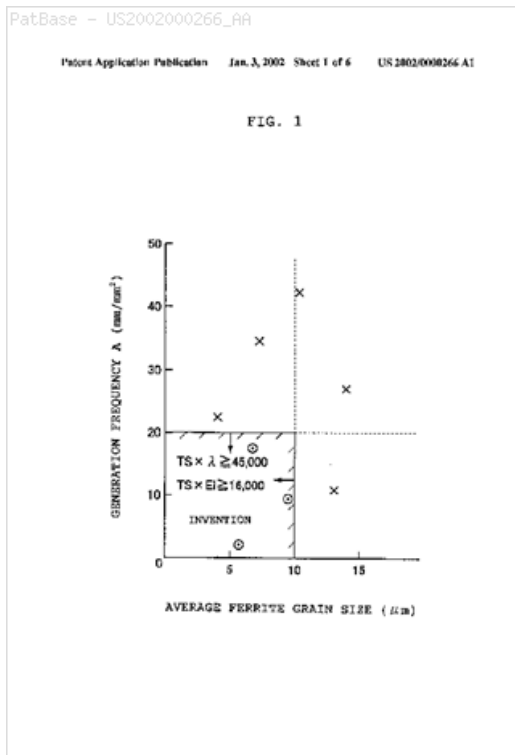
International (IPC 8-9): B21B3/00 C21D8/02 C21D9/46 C22C38/00 C22C38/04 C22C38/06 C22C38/12 C22C38/14 C22C38/24 C22C38/38 C23C2/02 C23C2/28 (Advanced/Invention); C22C38/00 C22C38/06 C22C38/38 (Advanced/Non-invention); B21B3/00 C21D9/46 C22C38/00 C22C38/04 C22C38/06 C22C38/38 (Core/Invention); C22C38/00 C22C38/06 C22C38/38 (Core/Non-invention)

International (IPC 1-7): B21B3/00 C21D8/00 C21D8/02 C21D9/46 C22C38/00 C22C38/04 C22C38/06 C22C38/18 C22C38/38 C22C38/40

CPC: C21D8/0226 C21D8/0236 C21D8/0263 C22C38/008 C22C38/04 C22C38/12 C22C38/14 C22C38/24 C23C2/02

European: C21D8/02D2 C22C38/00G C22C38/04 C22C38/12 C22C38/14 C22C38/24 C23C2/02 M21D8/02D6 M21D8/02F6

US: 148/32 148/320 148/320S 148/333 148/334 148/533 148/541 148/541S 148/547 148/602 148/602S 148/654 148/661



Family:

Publication number	Publication date	Application number	Application date
AT464402 E	20100415	AT20000960974T	20000913
DE60044180 D1	20100527	DE20006044180	20000913
EP1143022 A1	20011010	EP20000960974	20000913
EP1143022 A4	20060517	EP20000960974	20000913
EP1143022 B1	20100414	EP20000960974	20000913
EP2166121 A1	20100324	EP20100150015	20000913
EP2166122 A1	20100324	EP20100150016	20000913
JP2001152255 A2	20010605	JP20000075482	20000317
JP2002030347 A2	20020131	JP20000216316	20000717
JP2002080935 A2	20020322	JP20000259595	20000829
JP3911972 B2	20070509	JP20000216316	20000717
JP4273646 B2	20090603	JP20000259595	20000829
KR100415718 B1	20040124	KR20017003487	20010317
KR20010075195 A	20010809	KR20017003487	20000913
US2002000266 AA	20020103	US20010827597	20010405
US2004112482 AA	20040617	US20030625796	20030723
US2006065329 AA	20060330	US20050271428	20051110
US6663725 BB	20031216	US20010827597	20010405
WO0120051 A1	20010322	WO2000JP06252	20000913

Priority:

JP19990261418 19990916	JP20000075482 20000317	JP20000191410 20000626
JP20000216316 20000717	JP20000259595 20000829	EP20000960974 20000913
WO2000JP06252 20000913	US20010827597 20010405	US20030625796 20030723
US20050271428 20051110		

Probable Assignee: JFE HOLDINGS INC

Assignee(s): (std): IMADA SADANORI ; INAZUMI TORU ; INOUE TADASHI ; JFE STEEL CORP ; JFE HOLDINGS INC ; NIPPON KOKAN KK ; MOTUYASHIKI YOICHI ; KIKUCHI HIROYASU ; NAGATAKI YASUNOBU ; KAWASAKI STEEL CO ; ODAKE TAKAYUKI

Assignee(s): NKK CORP ; N CORPKK ; JFE ENGINEERING CORP

Inventor(s): (std): IMADA SADANORI ; INAZUMI TORU ; INOUE TADASHI ; KIKUCHI HIROYASU ; MOTUYASHIKI YOICHI ; NAGATAKI YASUNOBU ; ODAKE TAKAYUKI ; ODAKE TAKAYUKI

Inventor(s): ODAKE TAKAYUKI C O INT PROP DEPT JFE STEEL CORP ; NAGATAKI YASUNOBU C O INT PROP DEPT JFE STEEL CORP ; MOTUYASHIKI YOICHI C O INT PROP DEPT JFE STEEL... ; KIKUCHI HIROYASU C O INT PROP DEPT JFE STEEL CORP ; INOUE TADASHI C O INT PROP DEPT JFE STEEL CORP ; INAZUMI TORU C O INT PROP DEPT JFE STEEL CORP ; IMADA SADANORI C O INT PROP DEPT JFE STEEL CORP

Agent(s): HOFFMANN EITL; FRISHAUF HOLTZ GOODMAN AND CHICK PC

Designated states: AT BE CH CY DE DK ES FI FR GB GR IE IT KR LU MC NL PT SE US

Title: VEHICLE COLLISION ENERGY ABSORBING MEMBER EXCELLENT IN ENERGY ABSORBING PERFORMANCE AND MANUFACTURING METHOD THEREFOR

Abstract: A vehicle collision energy absorbing member is excellent in collision energy absorbing performance in the axial direction upon collision. The vehicle collision energy absorbing member is formed of a high strength thin steel sheet having TS of at least 980 MPa and having an n-value and a limit bending radius Rc satisfying the following Formula: $Rc/t \geq 1.31 \times \ln(n) + 5.21$.

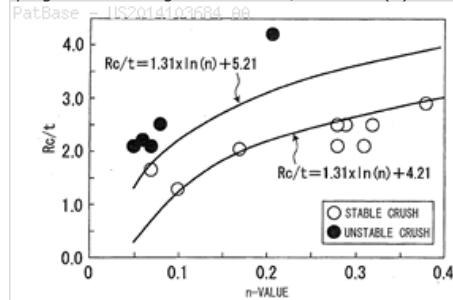
Classifications:

International (IPC 8-9): B21D53/88 B62D25/00 B62D29/00 C21D7/00 C21D8/02 C21D9/00 C21D9/46 C22C38/00 C22C38/02 C22C38/04 C22C38/06 C22C38/12 (Advanced/Invention); C21D9/46 (Advanced/Non-invention); B65D25/00 (Core/Invention)

International (IPC 1-7): B21D53/88 C21D9/46 C22C38/00 C22C38/12 **CPC:** B62D29/007 B21D53/88 C22C38/12 C21D9/46 C21D9/0068 C21D2211/001 C21D2211/005 C22C38/001 C22C38/02 C22C38/04 C22C38/06 Y10T29/49622

European: C21D9/00P C21D9/46 M21D211/00A M21D211/00F

US: 1/1 29/897.2 296/187.03



Family:

Publication number	Publication date	Application number	Application date
BR112013029160 A2	20170131	BR20131129160	20120423
BR112013029160 B1	20181121	BR20131129160	20120423
CA2835153 AA	20131105	CA20122835153	20120423
CA2835153 C	20161025	CA20122835153	20120423
CN103582714 A	20140212	CN201280022779	20120423
CN103582714 B	20151014	CN201280022779	20120423
DE602012037879 D1	20171109	DE201260037879T	20120423
EP2708610 A1	20140319	EP20120781669	20120423
EP2708610 A4	20151021	EP20120781669	20120423
EP2708610 B1	20170927	EP20120781669	20120423
IN03248KN2013 A	20140124	IN2013KN03248	20131104
JP2012251239 A2	20121220	JP20120095957	20120419
JP5856002 B2	20160209	JP20120095957	20120419
KR101570918 B1	20151120	KR20137029601	20120423
KR20130140176 A	20131223	KR20137029601	20120423
MX2013013193 A1	20140821	MX20130013193	20120423
MX351295 B	20171010	MX20130013193	20120423
RU2013155176 A	20150620	RU20130155176	20120423
RU2558779 C2	20150810	RU20130155176	20120423
TH132994 A	20140428	TH20121002195	20120511
TH67504 B	20190116	TH20121002195	20120511
TW201307126 A	20130216	TW20120115714	20120503
TW1494237 B	20150801	TW20120115714	20120503
US2014103684 AA	20140417	US20120116847	20120423
US9452792 BB	20160927	US20120116847	20120423
WO12153471 A1	20121115	WO2012JP02778	20120423

Priority:

JP20110107214 20110512 JP20120095957 20120419 EP20120781669 20120423
WO2012JP02778 20120423

Probable Assignee: HONDA MOTOR CO LTD

Assignee(s): (std): HONDA MOTOR CO LTD ; JFE STEEL CORP ; KAWASAKI STEEL CO ; SUGIURA TOMOAKI ; OKITSU YOSHITAKA ; OKUDA KANEHARU ; TAMAI YOSHIKIYO ; TAKAGI SHUSAKU ; TAKAKI NAOKI ; NAITO TADASHI ; FUJITA TAKESHI

Assignee(s): HONDA MOTOR CO ; DZHFE STIL KORPOREJSHN ; KHONDA MOTOR KO

Inventor(s): (std): YOSHITAKA OKITSU ; YOSHIKIYO TAMAI ; TOMOAKI SUGIURA ; TAMAJ ESIKIE ; TAMAI YOSHIKIYO ; TAKESHI FUJITA ; TAKAKI NAOKI ; TAKAGI SUSAKU ; TAKAGI SHUSAKU ; TAKAGI NAO ; TADASHI NAITO ; SUGIURA TOMOAKI ; SHUSAKU TAKAGI ; OKUDA KANEHARU ; OKUDA KANEHARU ; OKITSU YOSHITAKA ; OKITSU ESITAKA ; NAOKI TAKAKI ; NAJTO TADASI ; NAITO TADASHI ; NAITO MASASHI ; KANEHARU OKUDA ; FUJITA TAKESHI ; FUDZITA TAKESI

Agent(s): ROBIC; GRUENECKER PATENT U RECHTSANWALTE PARTG MBB; GRUENECKER KINKELDEY STOCKMAIR AND SCHWANHAEUSSER; DLA PIPER LLP; SUGIMURA KENJI

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

9) Family number: 55896620 (US2016115562A)

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Title: FERRITIC STAINLESS STEEL SHEET, METHOD FOR THE PRODUCTION THEREOF, AND USE OF THE SAME, ESPECIALLY IN EXHAUST LINES

Abstract: A ferritic stainless steel sheet of a composition, expressed in weight percentages: trace amounts?C?0.03 percent; 0.2

percent ?Mn?1 percent; 0.2 percent ?Si?1 percent; trace amounts?S?0.01 percent; trace amounts?P?0.04 percent; 15 percent ?Cr?22 percent; trace amounts?Ni?0.5 percent; trace amounts?Mo?2 percent; trace amounts?Cu?0.5 percent; 0.160 percent ?Ti?1 percent; 0.02 percent ?Al?1 percent; 0.2 percent ?Nb?1 percent; trace amounts?V?0.2 percent; 0.009 percent ?N?0.03 percent; trace amounts?Co?0.2 percent; trace amounts?Sn?0.05 percent; rare earths (REE)?0.1 percent; trace amounts?Zr?0.01 percent; the remainder of the composition consisting of iron and of inevitable impurities resulting from the elaboration; the Al and rare earth (REE) contents satisfying the relationship: $Al + 30 \times REE \geq 0.15$ percent; the Nb, C, N and Ti contents in percent satisfy the relationship: $1/[Nb + (7/4) \times Ti - 7 \times (C + N)] \geq 3$; said metal sheet having an entirely recrystallized structure and an average ferritic grain size comprised between 25 and 65 micro m. A method for manufacturing such a ferritic stainless steel sheet, and its use for manufacturing parts involving shaping and welding and intended to be subject to a periodic temperature of use comprised between 150 degrees centigrade and 700 degrees centigrade and to a projection of a mixture of water, urea and ammonia.

Classifications:

International (IPC 8-9): B22D7/00 C21D6/00 C21D8/02 C21D9/46 C22C38/00 C22C38/02 C22C38/04 C22C38/06 C22C38/20 C22C38/22 C22C38/24 C22C38/26 C22C38/28 C22C38/30 C22C38/42 C22C38/44 C22C38/46 C22C38/48 C22C38/50 C22C38/52 F01N3/20 (Advanced/Invention)
CPC: C22C38/004 C21D8/0205 C22C38/30 C22C38/26 C22C38/24 C22C38/22 C22C38/20 C22C38/002 C21D6/004 C21D6/005 C21D6/007 C21D6/008 C21D8/0263 C21D9/46 B22D7/00 F01N3/2066 F01N2610/02 C21D8/0226 C21D8/0236 C21D8/0273 C22C38/001 C22C38/005 C22C38/008 C22C38/02 C22C38/04 C22C38/06 C22C38/28 C21D6/002 C21D2211/005 C22C38/42 C22C38/44 C22C38/46 C22C38/48 C22C38/50 C22C38/52
US: 148/325 148/546 60/301

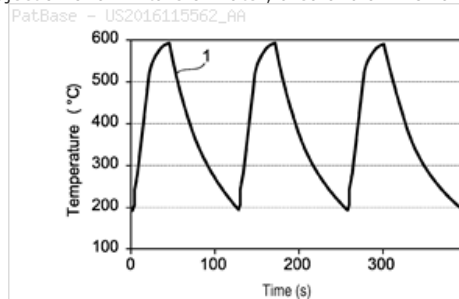


FIG.1

Family:

Publication number	Publication date	Application number	Application date
BR112015004633 A2	20170704	BR20151104633	20120903
CA2883538 AA	20150302	CA20122883538	20120903
CN104903482 A	20150909	CN201280076210	20120903
CN104903482 B	20170308	CN201280076210	20120903
EP2893049 A1	20150715	EP20120766456	20120903
IN01710DN2015 A	20150522	IN2015DN01710	20150302
JP2015532681 T2	20151112	JP20150529088T	20120903
KR20150099706 A	20150901	KR20157006981	20120903
MX2015002716 A1	20150814	MX20150002716	20120903
RU2015107432 A	20160927	RU20150107432	20120903
RU2603519 C2	20161127	RU20150107432	20120903
US2016115562 AA	20160428	US20120425313	20120903
US9873924 BB	20180123	US20120425313	20120903
WO14033372 A1	20140306	WO2012FR51969	20120903

Priority:

WO2012FR51969 20120903

Probable Assignee: APERAM STAINLESS FRANCE

Assignee(s): (std): APERAM STAINLESS FRANCE ; APERAM STEJNLESS FRANS ; ARCELORMITTAL STAINLESS FRANCE ; MIRAVAL CLAUDINE ; SANTACREU PIERRE OLIVIER ; SAEDLOU SAGHI

Inventor(s): (std): CLAUDINE MIRAVAL ; MIRAVAL CLAUDINE ; PIERRE OLIVIER SANTACREU ; SAEDLOU SAGHI ; SAGHI SAEDLOU ; SANTACREU PIERRE OLIVIER ; SEDLU SAGI ; SANTAKRE PER OLIVE ; MIRAVAL KLODIN

Agent(s): FASKEN MARTINEAU DUMOULIN LLP; BLOT PHILIPPE ROBERT EMILE; KNOBBE MARTENS OLSON AND BEAR LLP; DOMENEGO BERTRAND ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

10) Family number: 43112663 (IN00958KO2007A)

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Title: A METHOD OF PRODUCING ADVANCED HIGH STRENGTH STEEL FOR AUTOMOTIVE APPLICATION AND STEEL PRODUCED THEREOF

Abstract: This invention relates to a method of producing advanced high strength steel for automotive application comprising the steps of: preparing titanium and molybdenum added low carbon steel having selective composition in weight percent C - 0.05 - 0.10, Mn - 1.40 - 1.70, Si - 0.10 - 0.20, S - 0.01 max, P - 0.025 max, Al - 0.02 - 0.05, N - 60 ppm max, Ti - 0.080 - 0.10 and Mo - 0.20 - 0.25, through Basic Oxygen Furnace (BOF) - Ladle Furnace (LF) - continuous casting (CC) route; hot rolling cast slab into strips at a finish rolling temperature of 880 degrees centigrade - 910 degrees centigrade and at coiling temperature of 600 - 640 degrees centigrade to obtain a single phase ferrite phase of average grain size less than 4 micro m to strength the final steel strip / sheet on inter phase precipitation hardening of nano size ferrite from austenite - ferrite transformation; and characterize evaluating the final sheet / strip strength through test evaluation of tensile, charpy impact, high and low cycle fatigue at room temperature, bend properties, microstructure and stretch flangeability.

Classifications:

International (IPC 8-9): C21D9/46 (Advanced/Invention)

International (IPC 1-7): C21D8/00

TATA STEEL LIMITED

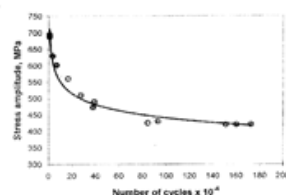
2 Sheets
Sheet 1

Fig.1

(B-BAS)
E. S. DAVAR & Co.
APPLICANTS' AGENT

Family:

Publication number	Publication date	Application number	Application date
IN00958K02007 A	20090403	IN2007K000958	20070703
IN00993K02015 A	20171110	IN2015K000993	20150916
IN241163 B	20100625	IN2007K000958	20070703

Priority:

IN2007K000958 20070703

Probable Assignee: TATA STEEL LTD**Assignee(s):** TATA STEEL LTD**Inventor(s):** BHATTACHARJEE DEBASHISH ; HALDAR ARUNANSU ; JHA GAJENDRA ; SIDDHARTHA MISRA ; SAURABH HADAS ; SAURABH KUNDU ; VENUGOPALAN T ; V V MAHASHABDE ; SUBRATA MUKHERJEE**11) Family number: 43144842 (US2009098408A)**

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Title: COMPLEX METALLOGRAPHIC STRUCTURED STEEL AND METHOD OF MANUFACTURING SAME

Abstract: A multi-phase steel sheet having microstructure having in combination ferrite, martensite of between 3 percent and 65 percent by volume, and at least one microstructure selected from the group consisting of, bainite and retained austenite, and having fine complex precipitates selected from the group of TiC, NbC, TiN, NbN, (Ti.Nb)C, (Ti.Nb)N, and (Ti.Nb)(C.N) particles having at least 50 percent smaller than 20 nm in size, and physical properties having tensile strength greater than about 780 megapascals and at least one of the properties of elongation greater than about 10 percent, yield ratio greater than about 70 percent, and hole expansion ratio greater than about 50 percent.

Classifications:

International (IPC 8-9): B32B15/01 B32B15/02 B32B15/04 C21D6/00 C21D8/02 C21D9/46 C22C38/00 C22C38/02 C22C38/04 C22C38/06 C22C38/08 C22C38/12 C22C38/14 C22C38/16 C22C38/20 C22C38/24 C22C38/26 C22C38/28 C22C38/38 C22C38/42 C22C38/46 C22C38/48 C22C38/50 C22C38/58 C23C2/06 C23C2/12 C23C2/40 (Advanced/Invention);

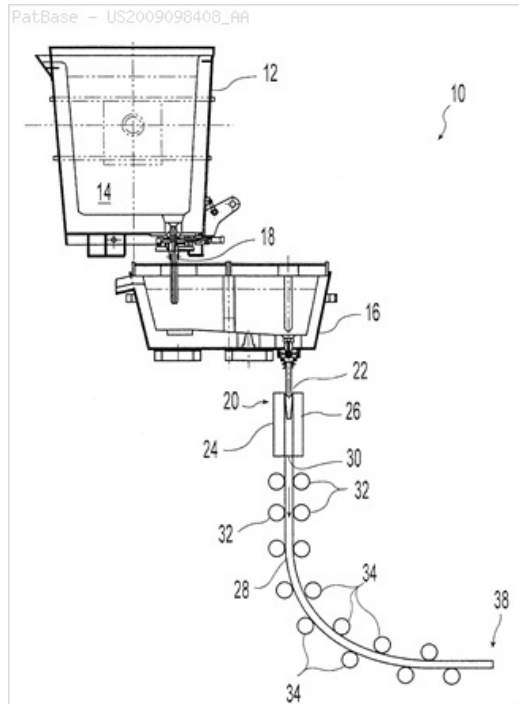
B32B15/02 C21D8/02 C21D9/46 C22C38/00 C22C38/08 C22C38/12 C22C38/20 C23C2/06 (Core/Invention)

International (IPC 1-7): C22C38/00

CPC: C22C38/58 B32B15/012 B32B15/013 B32B15/043 C22C38/001 C22C38/02 C22C38/08 C22C38/12 C22C38/14 C22C38/16 C22C38/20 C22C38/24 C22C38/26 C22C38/28 C22C38/38 C22C38/42 C22C38/46 C22C38/48 C22C38/50 C22C38/04 C22C38/06 C21D6/005 C21D8/0215 C21D8/0263 C21D9/46 C21D2211/001 C21D2211/002 C21D2211/004 C21D2211/005 C21D2211/008 C23C2/06 C23C2/12 C23C2/40 Y10T428/12757 Y10T428/12799 Y10T428/12972 C22C38/002 C22C38/18

European: C21D6/00H C21D8/02B2 C21D8/02F6 C21D9/46 C22C38/04 C22C38/06 C23C2/06 C23C2/12 C23C2/40 M21D211/00A M21D211/00B M21D211/00D M21D211/00F M21D211/00M

US: 1/1 148/538 148/540 148/541 420/87 420/90 420/92 420/93 428/653 428/659 428/684



Family:

Publication number	Publication date	Application number	Application date
AU2008311043 AA	20090416	AU20080311043	20081006
AU2008311043 BB	20130221	AU20080311043	20081006
BRPI0818530 A2	20150616	BR2008PI18530	20081006
CA2701903 AA	20090416	CA20082701903	20081006
CA2701903 C	20170228	CA20082701903	20081006
EP2209926 A1	20100728	EP20080838499	20081006
EP2209926 A4	20161019	EP20080838499	20081006
IN02005CN2010 A	20100910	IN2010CN02005	20100409
MX2010003835 A1	20100513	MX20100003835	20081006
US2009098408 AA	20090416	US20080246205	20081006
US2013136950 AA	20130530	US20130754721	20130130
US8435363 BB	20130507	US20080246205	20081006
US9157138 BB	20151013	US20130754721	20130130
WO09048838 A1	20090416	WO2008US78946	20081006

Priority:

US20070978997P 20071010 US20080246205 20081006 WO2008US78946 20081006
US20130754721 20130130

Probable Assignee: NUCOR CORP

Assignee(s): (std): NUCOR CORP ; SUN WEIPING

Inventor(s): (std): SUN WELPING ; SUN WEIPING

Inventor(s): WEIPING SUN ; WELPING SUN

Agent(s): MALLESONS STEPHEN JAKUES; KING AND WOOD MALLESONS; MINTER ELLISON; BERESKIN AND PARR LLP
SENCRL SRL; GRUENECKER KINKELDEY STOCKMAIR AND SCHWANHAUESSER ANWALTSSOZIETAET; HAHN
LOESER AND PARKS LLP; MOORE AND VAN ALLEN PLLC; NABORS WILLIAM S ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ
DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP
KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ
NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM
TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

12) Family number: 41685877 (US2010043928A)

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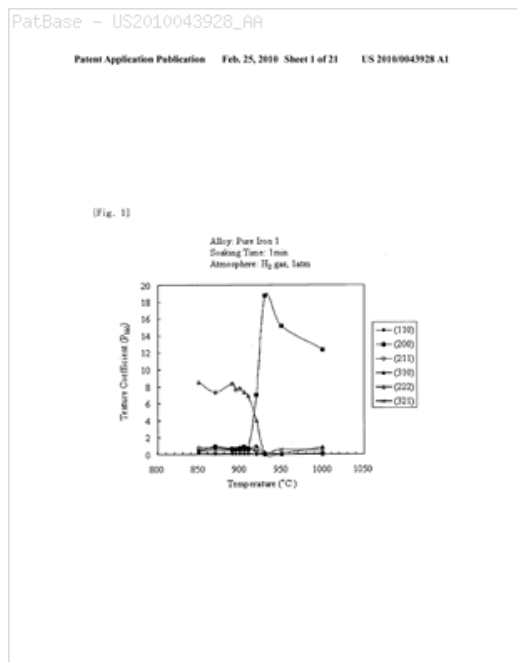
Title: METHOD OF FORMING TEXTURE ON SURFACE OF IRON OR IRON-BASE ALLOY SHEET, METHOD OF MANUFACTURING
NON-ORIENTED ELECTRICAL STEEL SHEET BY USING THE SAME AND NON-ORIENTED ELECTRICAL STEEL SHEET
MANUFACTURED BY USING THE SAME

Abstract: An iron or iron-base alloy sheet having high proportion of {100} texture and a method of manufacturing the same. A method of forming grains having {100} plane parallel to the sheet surface is disclosed. A Fe or Fe-base alloy sheet is annealed at austenite (gamma) temperature while minimizing an effect of oxygen in the sheet or on surfaces of the sheet or a heat treatment atmosphere, and then the above sheet is subject to phase transformation to ferrite (α). On surfaces of the resulting sheet, a high proportion of {100} texture develops. A method of manufacturing electrical steel sheet is disclosed. The grains with {100} texture on surfaces grow to have a grain size of at least half the thickness of the sheet by a gamma-α transformation. By adopting the above disclosed methods, an iron or iron-base alloy sheet with excellent texture can be simply manufactured within short time.

Classifications:

International (IPC 8-9): C21D1/00 C21D1/773 C21D6/00 C21D8/12

C21D9/46 C22C38/00 C22C38/04 H01F1/16 (Advanced/Invention);
C21D1/00 C22C38/00 (Advanced/Non-invention);
C21D1/00 C21D1/74 C21D6/00 C21D9/46 C22C38/00 C22C38/04
H01F1/12 (Core/Invention)
International (IPC 1-7): C21D1/00
CPC: C22C38/02 C22C38/06 C22C38/08 C22C38/16 C22C38/18
C21D8/1255 C21D8/1272 C21D9/46 C21D1/26 C21D6/008
European: C21D1/26 C21D6/00K C21D9/46
US: 148/112 148/113 148/307 148/308 148/579 148/579S 148/628
148/660 148/660S



Family:

Publication number	Publication date	Application number	Application date
BRPI0719460 A2	20140204	BR2007PI19460	20071221
BRPI0719460 B1	20170328	BR2007PI19460	20071221
CN101568652 A	20091028	CN200780047615	20071221
CN101568652 B	20120718	CN200780047615	20071221
EP2102375 A1	20090923	EP20070851702	20071221
EP2102375 A4	20170621	EP20070851702	20071221
IN01336MN2009 A	20100305	IN2009MN01336	20090716
IN294258 B	20180316	IN2009MN01336	20090716
JP2010513716 T2	20100430	JP20090542654T	20071221
JP5754042 B2	20150722	JP20090542654T	20071221
KR100797895 B1	20080124	KR20060133074	20061222
TW200835794 A	20080901	TW20070149484	20071221
TWI342339 B	20110521	TW20070149484	20071221
US2010043928 AA	20100225	US20070520635	20071221
US8361243 BB	20130129	US20070520635	20071221
WO08078921 A1	20080703	WO2007KR06737	20071221

Priority:

KR20060133074 20061222 WO2007KR06737 20071221

Probable Assignee: CHENG ZHENQING

Assignee(s): (std): CHENG ZHENQING ; JIN KYUNG SUNG ; KYUNG SUNG JIN ; SUNG JIN KYUNG

Inventor(s): (std): SUNG JIN KYUNG ; KYUNG SUNG JIN ; JIN KYUNG SUNG

Agent(s): BEHNISCH WERNER; KIMURA TAKAHISA; JAE Y PARK; KILE PARK GOEKJIAN REED AND MCMANUS PLLC; MUHANN PATENT AND LAW FIRM

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

13) Family number: 55157901 (JP2013237877A)

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Title: HIGH YIELD RATIO TYPE HIGH STRENGTH STEEL SHEET, HIGH YIELD RATIO TYPE HIGH STRENGTH COLD ROLLED STEEL SHEET, HIGH YIELD RATIO TYPE HIGH STRENGTH GALVANIZED STEEL SHEET, HIGH YIELD RATIO TYPE HIGH STRENGTH HOT DIP GALVANIZED STEEL SHEET, HIGH YIELD RATIO TYPE HIGH STRENGTH HOT DIP GALVANNEALED STEEL SHEET, METHOD FOR PRODUCING HIGH YIELD RATIO TYPE HIGH STRENGTH COLD ROLLED STEEL SHEET, METHOD FOR PRODUCING HIGH YIELD RATIO TYPE HIGH STRENGTH HOT DIP GALVANIZED STEEL SHEET AND METHOD FOR PRODUCING HIGH YIELD RATIO TYPE HIGH STRENGTH HOT DIP GALVANNEALED STEEL SHEET

Abstract: PROBLEM TO BE SOLVED: To provide a high yield ratio type high strength steel sheet having high strength and a high yield ratio and having excellent formability, and the like.SOLUTION: A high yield ratio type high strength steel sheet has a componential composition including, by mass, 0.03 to 0.20 percent C, less than or equal to 1.0 percent Si, >1.5 to 3.0 percent Mn, less than or equal to 0.10 percent P, less than or equal to 0.05 percent S, less than or equal to 0.10 percent Al and less than or equal to 0.010 percent N, and including one or more kinds selected from Ti, Nb and V by 0.010 to 1.000 percent in total content and the balance Fe with inevitable impurities, and has a structure including ferrite and a second phase as a microstructure. The ferrite has an area ratio of greater than or equal to 50 percent and the average crystal grain size of less than or equal to 18 micro m. The second phase includes martensite of 1 to <7 percent by area ratio, and the thickness of a band-shaped structure formed by the second phase satisfies a prescribed relational expression.

Classifications:

International (IPC 8-9): B22D C21D8/02 C21D9/46 C22C38/00 C22C38/38 C22C38/46 C22C38/48 C22C38/50 C22C38/60 C23C2/02 C23C2/06 C23C2/28 (Advanced/Invention); C21D9/46 C22C38/00 C22C38/60 C23C2/06 C23C2/28 (Core/Invention); C22C (Subclass/Invention)
International (IPC 1-7): C22C38/00

Family:

Publication number	Publication date	Application number	Application date
BR102012025656 A2	20180102	BR20121025656	20121008
IN00870KO2012 A	20131115	IN2012K000870	20120731
JP2013237877 A2	20131128	JP20120109901	20120511
RU2012143206 A	20140420	RU20120143206	20121009
RU2531216 C2	20141020	RU20120143206	20121009
TH136352 A	20140901	TH20121006176	20121128
ZA201209143 A	20130828	ZA20120009143	20121204

Priority:

JP20120109901 20120511

Probable Assignee: JFE HOLDINGS INC

Assignee(s): (std): JFE HOLDINGS INC ; JFE STEEL CORP ; KAWASAKI STEEL CO

Assignee(s): DZHFE STIL KORPOREJSHN

Inventor(s): (std): HASEGAWA HIROSHI ; HIROSHI HASEGAWA ; KANEHKO SINDZIRO ; KANEKO SHINJIRO ; KAVASAKI ESIJASU ; KAWASAKI YOSHIYASU ; KHASHGAVA KHIROSI ; NAGATAKI JASUNOBU ; NAGATAKI YASUNOBU ; SHINJIRO KANEKO ; YASUNOBU NAGATAKI ; YOSHIYASU KAWASAKI

Agent(s): SAKAI HIROAKI

14) Family number: 3348912 (US4950336A)

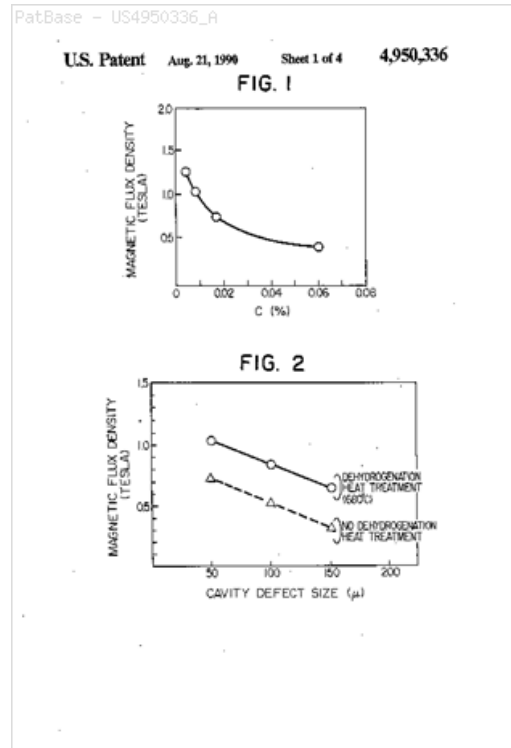
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Title: Method of producing non-oriented magnetic steel heavy plate having high magnetic flux density

Abstract: A method of producing non-oriented magnetic steel heavy plate that has good magnetic properties in a low magnetic field that comprises hot-rolling high-purity steel, adjusting the crystal grain size and dehydrogenation treatment, whereby the a uniform ferrite grain diameter is imparted to the steel.

Classifications:

International (IPC 8-9): C21D3/06 C21D8/12 C22C38/00 C22C38/04 C22C38/06 C22C38/14 C22C38/22 C22C38/28 C22C38/44 (Advanced/Invention); C21D3/00 C21D8/12 C22C38/00 C22C38/04 C22C38/06 C22C38/14 C22C38/22 C22C38/28 C22C38/44 (Core/Invention)
International (IPC 1-7): C21D8/12 C22C38/00 C22C38/04 C22C38/06 C22C38/14 C22C38/22 C22C38/28 C22C38/44 H01F1/047
CPC: C21D3/06 C21D8/1222
European: C21D3/06 C21D8/12D2
US: 148/111 148/112

**Family:**

Publication number	Publication date	Application number	Application date
DE68921377 D1	19950406	DE19896021377	19890623
DE68921377 T2	19951102	DE19896021377T	19890623
EP0349853 A2	19900110	EP19890111463	19890623
EP0349853 A3	19910130	EP19890111463	19890623
EP0349853 B1	19950301	EP19890111463	19890623
JP1956374 C3	19950728	JP19880154643	19880624
JP1956375 C3	19950728	JP19880154644	19880624
JP1956376 C3	19950728	JP19880154645	19880624

JP1969289 C3	19950918	JP19880154642	19880624
JP1979797 C3	19951017	JP19880154640	19880624
JP2004918 A2	19900109	JP19880154640	19880624
JP2004919 A2	19900109	JP19880154641	19880624
JP2004920 A2	19900109	JP19880154642	19880624
JP2004921 A2	19900109	JP19880154643	19880624
JP2004922 A2	19900109	JP19880154644	19880624
JP2004923 A2	19900109	JP19880154645	19880624
JP2008323 A2	19900111	JP19880156718	19880627
JP2008324 A2	19900111	JP19880156719	19880627
JP2008325 A2	19900111	JP19880156720	19880627
JP2008326 A2	19900111	JP19880156722	19880627
JP2013321 C3	19960202	JP19880156718	19880627
JP2013322 C3	19960202	JP19880156719	19880627
JP2013323 C3	19960202	JP19880156720	19880627
JP2013324 C3	19960202	JP19880156722	19880627
JP2126681 C3	19970128	JP19880154641	19880624
JP6089399 B4	19941109	JP19880154643	19880624
JP6089400 B4	19941109	JP19880154644	19880624
JP6089401 B4	19941109	JP19880154645	19880624
JP6104866 B4	19941221	JP19880154642	19880624
JP7011026 B4	19950208	JP19880154640	19880624
JP7045688 B4	19950517	JP19880154641	19880624
JP7045689 B4	19950517	JP19880156718	19880627
JP7045690 B4	19950517	JP19880156719	19880627
JP7045691 B4	19950517	JP19880156720	19880627
JP7045692 B4	19950517	JP19880156722	19880627
US4950336 A	19900821	US19890368031	19890619

Priority:

JP19880154640 19880624	JP19880154641 19880624	JP19880154642 19880624
JP19880154643 19880624	JP19880154644 19880624	JP19880154645 19880624
JP19880156718 19880627	JP19880156719 19880627	JP19880156720 19880627
JP19880156722 19880627		

Probable Assignee: NIPPON STEEL A JAPAN CORP CORP

Assignee(s): (std): NIPPON STEEL CORP

Assignee(s): NIPPON STEEL CORP TOKIO TOKYO JP ; SHINNIPPON SEITETSU KK ; NIPPON STEEL A JAPAN CORP CORP

Inventor(s): (std): KUMAGAI TATSUYA ; TOMITA YUKIO ; TOMITA YUKIO C O NIPPON STEEL ; TSUDA YUKIO ; TSUDA YUKIO C O NIPPON STEEL C ; YAMANAKA KATSUYOSHI ; YAMANAKA KATSUYOSHI C O NIPPON ; YAMABA RYOTA ; YAMABA RYOTA C O NIPPON STEEL ; KUMAGAI TASTUYA C O NIPPON STE

Inventor(s): KUMAGAI TASTUYA C O NIPPON STEEL CORPORATIO... ; KUMAGAI TASTUYA C O NIPPON STEEL CORPORATION ; YAMABA RYOTA C O NIPPON STEEL CORPORATION ; YAMANAKA KATSUYOSHI C O NIPPON STEEL CORPORATION ; YAMANAKA KATSUYOSHI C O NIPPON STEEL... ; YAMANAKA KATSUYOSHI C O NIPPON STEEL CORPORATION T ; YAMABA RYOTA C O NIPPON STEEL CORPORATION TOKAI CI ; TSUDA YUKIO C O NIPPON STEEL CORPORATION TOKAI CIT ; TOMITA YUKIO C O NIPPON STEEL CORPORATION TOKAI CI ; KUMAGAI TASTUYA C O NIPPON STEEL CORPORATIO TOKAI ; TSUDA YUKIO C O NIPPON STEEL CORPORATION ; TSUDA YUKIO C O NIPPON STEEL CORPORATION TOKAI... ; TOMITA YUKIO C O NIPPON STEEL CORPORATION

Designated states: DE FR