Appeal decision

Appeal No. 2017-12429

Hyogo, Japan
Appellant SANYO SPECIAL STEEL CO., LTD.

Hyogo, Japan
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The case of appeal against the examiner's decision of refusal for Japanese Patent Application No. 2013-65257, titled "STEEL FOR ANTICORROSIVE PLASTIC MOLDING DIE EXCELLENT IN SPECULARITY" [laying-open of unexamined application on October 6, 2014 as Japanese Unexamined Patent Application Publication No. 2014-189822, the number of claims: 8] has resulted in the following appeal decision.

Conclusion

The examiner's decision is revoked.

The invention of the present application shall be granted a patent.

Reason

No. 1 History of the procedures

The application is an application with a filing date of March 26, 2013, for which a notice of reason for refusal dated November 8, 2016 was issued, and a written opinion and a written amendment were submitted on December 26, 2016, and an Examiner's decision of refusal (examiner's decision) dated May 24, 2017 was issued. In response, the appeal was filed on August 22, 2017 with a written amendment at the same time. A reconsideration report dated October 12, 2017 was made to the JPO Commissioner in the procedure of reconsideration by an examiner before appeal proceedings, and the Appellant made a statement on the reconsideration report on November 13, 2017.

No. 2 Outline of the examiner's decision

The outline of the examiner's decision of refusal (decision of refusal dated May 24, 2017) is set forth as below:

(Support Requirement) The inventions according to Claims 1, 3, 5, and 7 fail to specify the contents of P, S, Al, and O, which are not described in the Detailed Description of the Invention. Thus the scope of claims of this application fails to conform to the requirement provided in Article 36(6)(i) of the Patent Act.

No. 3 The Inventions of the application

The inventions according to Claims 1 to 8 of the application (hereinafter referred to as "the claimed invention 1" to "the claimed invention 8", respectively) are specified in the following by the matters recited in Claims 1 to 8 of the scope of the claims that have been amended by the written amendment submitted on August 22, 2017:

" [Claim 1]

A steel for anticorrosive plastic molding die excellent in specularity on a mass % basis comprising C: 0.20 to 0.40%, Si: 0.2 to 1.0%, Mn: 1.0% or less, Cr: 12.0 to 15.0%, Mo+W/2: 0.4% or less, V: 0.1 to less than 1.0%, and N: less than 100 ppm, and the balance consisting of Fe and inevitable impurities, wherein as a carbide and a carbonitride precipitated and contained in the steel, the carbonitride has a particle diameter of 5 μm or less, and the number of carbide particles in the roll surface of the steel is 160 or less per 100 μm-square, and further the difference in the number of carbide particles per 50 μm-square in 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part is 30 or less.

[Claim 2]

A steel for anticorrosive plastic molding die excellent in specularity on a mass % basis comprising C: 0.20 to 0.40%, Si: 0.2 to 1.0%, Mn: 1.0% or less, Cr: 12.0 to 15.0%, Mo+W/2: 0.4% or less, V: 0.1 to less than 1.0%, N: less than 100 ppm, P: 0.030% or less, S: 0.010% or less, Al: 0.05% or less, and O: 0.0100% or less, and the balance consisting of Fe and inevitable impurities, wherein as a carbide and a carbonitride precipitated and contained in the steel, the carbonitride has a particle diameter of 5 μm or less, and the number of carbide particles in the roll surface of the steel is 160 or less per 100 μm-square, and further the difference in the number of carbide particles per 50 μm-square in 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part is 30 or less.

[Claim 3]

A steel for anticorrosive plastic molding die excellent in specularity on a mass % basis comprising C: 0.20 to 0.40%, Si: 0.2 to 1.0%, Mn: 1.0% or less, Cr: 12.0 to 15.0%, Mo+W/2: 0.4% or less, V: 0.1 to less than 1.0%, N: less than 100 ppm, Ni: 0.04 to 0.40%, and the balance consisting of Fe and inevitable impurities, wherein as a carbide and a carbonitride precipitated and contained in the steel, the carbonitride has a particle diameter of 5 μm or less, and the number of carbide particles in the roll surface of the steel is 160 or less per 100 μm-square, and further the difference in the number of carbide particles per 50 μm-square in 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part is 30 or less.

[Claim 4]

A steel for anticorrosive plastic molding die excellent in specularity on a mass % basis comprising C: 0.20 to 0.40%, Si: 0.2 to 1.0%, Mn: 1.0% or less, Cr: 12.0 to 15.0%, Mo+W/2: 0.4% or less, V: 0.1 to less than 1.0%, N: less than 100 ppm, P: 0.030% or less, S: 0.010% or less, Al: 0.05% or less, and O: 0.0100% or less, Ni: 0.04 to 0.40%, and the balance consisting of Fe and inevitable impurities, wherein as a carbide and a carbonitride precipitated and contained in the steel, the carbonitride has a particle diameter of 5 μm or less, and the number of carbide particles in the roll surface of the steel is 160 or less per 100 μm-square, and further the difference in the number of

carbide particles per 50 μm-square in 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part is 30 or less.

[Claim 5]

A steel for anticorrosive plastic molding die excellent in specularity on a mass % basis comprising C: 0.20 to 0.40%, Si: 0.2 to 1.0%, Mn: 1.0% or less, Cr: 12.0 to 15.0%, Mo+W/2: 0.4% or less, V: 0.1 to less than 1.0%, and N: less than 100 ppm, and further comprising 0.01 to 0.30% of one or two or more kinds of Ti, Nb, Ta, and Zr, and the balance consisting of Fe and inevitable impurities, wherein as a carbide and a carbonitride precipitated and contained in the steel, the carbonitride has a particle diameter of 5 μm or less, and the number of carbide particles in the roll surface of the steel is 160 or less per 100 μm-square, and further the difference in the number of carbide particles per 50 μm-square in 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part is 30 or less.

[Claim 6]

A steel for anticorrosive plastic molding die excellent in specularity on mass % basis comprising C: 0.20 to 0.40%, Si: 0.2 to 1.0%, Mn: 1.0% or less, Cr: 12.0 to 15.0%, Mo+W/2: 0.4% or less, V: 0.1 to less than 1.0%, N: less than 100 ppm, P: 0.030% or less, S: 0.010% or less, Al: 0.05% or less, and O: 0.0100% or less, and further comprising 0.01 to 0.30% of one or two or more kinds of Ti, Nb, Ta, and Zr, and the balance consisting of Fe and inevitable impurities, wherein as a carbide and a carbonitride precipitated and contained in the steel, the carbonitride has a particle diameter of 5 μm or less, and the number of carbide particles in the roll surface of the steel is 160 or less per 100 μm-square, and further the difference in the number of carbide particles per 50 μm-square in 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part is 30 or less.

[Claim 7]

A steel for anticorrosive plastic molding die excellent in specularity on a mass % basis comprising C: 0.20 to 0.40%, Si: 0.2 to 1.0%, Mn: 1.0% or less, Cr: 12.0 to 15.0%, Mo+W/2: 0.4% or less, V: 0.1 to less than 1.0%, and N: less than 100 ppm, Ni: 0.04 to 0.40% and further comprising 0.01 to 0.30% of one or two or more kinds of Ti, Nb, Ta, and Zr, and the balance consisting of Fe and inevitable impurities, wherein as a carbide and a carbonitride precipitated and contained in the steel, the carbonitride has a particle diameter of 5 μm or less, and the number of carbide particles in the roll surface of the steel is 160 or less per 100 μm-square, and further the difference in the number of carbide particles per 50 μm-square in 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part is 30 or less.

[Claim 8]

A steel for anticorrosive plastic molding die excellent in specularity on mass % basis comprising C: 0.20 to 0.40%, Si: 0.2 to 1.0%, Mn: 1.0% or less, Cr: 12.0 to 15.0%, Mo+W/2: 0.4% or less, V: 0.1 to less than 1.0%, N: less than 100 ppm, P: 0.030% or less, S: 0.010% or less, Al: 0.05% or less, O: 0.0100% or less, and Ni: 0.04 to 0.40%, and further comprising 0.01 to 0.30% of one or two or more kinds of Ti, Nb, Ta, and Zr, and the balance consisting of Fe and inevitable impurities, wherein as a carbide and a carbonitride precipitated and contained in the steel, the carbonitride has a particle diameter of 5 μm or less, and the number of carbide particles in the roll surface of the steel is 160 or less per 100 μm-square, and further the difference in the number of

carbide particles per 50 μm-square in 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part is 30 or less."

No. 4 Judgment by the body
Regarding the conformance to the Support Requirement of the specification

Whether the statement of the scope of claims satisfies the Support Requirement of a Description should be determined by considering, through comparison of the statement of the scope of claims and the statement of the detailed explanation of the invention, whether the invention described in the scope of claims is the invention described in the detailed explanation of the invention that is within the scope for which a person ordinarily skilled in the art can recognize, based on the statement of the detailed explanation of the invention, that the invention can solve the problem to be solved by the invention, and also by considering whether the invention described in the scope of claims is an invention within the scope for which a person ordinarily skilled in the art can recognize, in light of the common general technical knowledge as of the time of filing the application, that the invention can solve the problem to be solved by the invention, even without the statement and indication thereof.

Based on the perspective, consideration is given hereinafter to the Inventions 1 to 8.

(1) Problem to be solved by the Inventions 1 to 8
A The Description of the Detailed Description of the Invention has the following description: Note that the underlines are provided by the body. The same shall apply hereinafter.
"[0008]

The problem to be solved by the invention is to provide a novel steel for anticorrosive plastic molding die excellent in specularity by obtaining a steel consisting of novel chemical components as a steel for plastic molding die, and adjusting a particle size of carbonitride, a number of carbide particles per 100 μm-square on a surface parallel to a rolling direction of the steel (hereinafter referred to as a roll surface) and a difference in the number of carbide particles per 50 μm-square in 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part to specific ranges in a carbide and a carbonitride precipitated and contained in the steel."

B According to the aforesaid A, a problem to be solved by the Inventions 1 to 8 (hereinafter simply referred to as the "problem") is "to provide a novel corrosion-resistant steel having high specularity for plastic molding die".

(2) The scope for which a person ordinarily skilled in the art can recognize that the problem of the Inventions 1 to 8 can be solved.
A There is also the following description in the Detailed Description of the Invention:
(A) "[Advantage of the Invention]
[0017]

By use of the above means, the present invention may provide a steel for plastic molding die excellent in specularity and corrosion resistance and, the steel being usable for a die or a tool for molding plastic products such as an optical disk, in which high

surface smoothness is required. The steel for plastic molding die of the present invention has a small particle diameter of carbonitride on a steel surface without causing pores due to slipping off of these carbonitride in mirror polishing, a less number of carbide particles per 100 μm-square of roll surface without causing a large amount of fine irregularity in the part, and further has a smaller difference in the number of carbide per 50 μm-square in 300 μm-square of the roll surface between a number of a maximum part and a number of a minimum part, which causes excellent effects such as preventing the minimum part from being easily polished and preventing the occurrence of rolling on a specular surface."

(B) "[0019]

C: 0.20 to 0.40%

C is an element necessary for improved hardness, corrosion resistance, and hardenability by strengthened solid solution. For this purpose, C is required to be 0.20% or more. However, if C exceeds 0.40%, a coarse carbide is formed and the specularity of molding die deteriorates, and the corrosion resistance deteriorates. Therefore, C is set to 0.20 to 0.40%."

"[0022]

Cr: 12.0 to 15.0%

Cr is an element that imparts passivity and improves corrosion resistance with improved hardenability. For this purpose, Cr is required to be 12.0% or more. However, if Cr exceeds 15.0%, a coarse carbide is formed and the specularity of molding die deteriorates. Therefore, Cr is set to 12.0 to 15.0%."

(C) "[0026]

P: 0.030% or less

P segregates grain boundaries and deteriorates toughness. Therefore, P is set to 0.030% or less.

[0027]

S: 0.010% or less, preferably 0.0050% or less

S forms a sulfide, which deteriorates specularity, and further deteriorates toughness and hot workability. Therefore, S is set to 0.010% or less, preferably 0.0050% or less.

[0028]

Al: 0.05% or less, preferably 0.03% or less

Al forms oxides and nitrides and deteriorates specularity. Therefore, Al is set to 0.05% or less, preferably 0.03% or less.

[0029]

O: 0.0100% or less, preferably 0.0050% or less

O forms oxides with the other metal elements and deteriorates specularity. Therefore, O is set to 0.0100% or less, preferably 0.0050% or less."

(D) "[0033]

Particle diameter of carbonitiride: 5μm or less, preferably 4 μm or less

Carbonitiride falls off from steel surface to form a pore in polishing if it is coarse, which deteriorates specularity. Therefore, the particle diameter of carbonitiride is adjusted to 5 μm or less, preferably 4 μm or less.

[0034]

The number of carbide particles per 100 μm-square in the roll surface of the steel: 160 or less

If the number of carbide particles per 100 μm-square in the roll surface of the steel is too large, a large amount of fine irregularity generates in the part. Therefore, the number of carbide particles per 100 μm-square in the roll surface of the steel is adjusted to 160 or less."

[0035]

The difference in the number of carbide particles per 50 μm-square per 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part: 30 or less

If the difference in the number of carbide particles per 50 μm-square in 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part is large, the minimum part tends to be polished, which causes rolling in a specular surface. Therefore, the difference in the number of carbide particles per 50 μm-square in 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part is adjusted to 30 or less."

(E) "[0036]

Further, the mode(s) for carrying out the invention are illustrated in series in the following with reference to a Table. First, the following production methods (1) and (2) may be suitably applied as a method for realizing a state of carbide precipitation in which a high specularity is achieved in the steel according to the present invention.

[0037]

(1) The production method comprising subjecting a casting material consisting of chemical components of steel of the present invention to remelting for a secondary melting, followed by resolidification. Commonly the casting material is subjected to a secondary melting by vacuum arc remelting method (VAR) or electroslag remelting (ESR), and resolidified. Specifically, this method undergoes the solidification after remelting in a short time by a secondary dissolution, thereby allowing us to suppress the occurrence of solidification segregation and the partial agglomeration of carbides.

[0038]

(2) The production method in which the steel melted and resolidified in the above item (1) is subjected to a soaking treatment at 1000 to 1200°C for 10 hours or more. This production method is the optimal production method for controlling a coarse carbide precipitated in a steel to an appropriate size. This soaking treatment needs to be implemented at a temperature higher than a hardening temperature and lower than a melting point. If the soaking treatment is properly implemented, it allows us to reduce a size of a coarse carbide formed, and further reduce the amount of carbide and cause carbide to be uniformly dispersed. Additionally, a temperature and a time suitable for the soaking treatment differ depending on its components."

(F) "[Example 1]

[0039]

Produced was a 100 kg steel for plastic molding die consisting of chemical components of the invented steel shown in Table 1 in a vacuum induction melting furnace. The obtained steel material by this production was subjected to a soaking

treatment for 10 hours in a holding furnace heated to 1200°C, and elongated into a square log of 50 mm-square size, and then subjected to a hardening treatment by heating at 1030°C and air cooling, and further subjected twice to an annealing treatment by heating at 200 to 500°C and air cooling.

On the other hand, a 100 kg steel with a chemical composition deviated from the range of the chemical composition of the invented steel of Table 1 was produced in a vacuum induction melting furnace as a comparative steel. The obtained steel material was subjected to a soaking treatment for 10 hours in a holding furnace heated to 1200°C, and elongated into a square log of 50 mm-square size, and then subjected to a hardening treatment by heating at 1030°C and air cooling. Similar treatment was applied as in the invented steel of the examples of the present invention, but the annealing treatment was not implemented.

Hardening tempering hardness was set to 50 HRC or more.

[0040]

[Table 1]

区分	No.	C	Si	Mn	P	S	Ni	Cr	Mo+1/2W	V	Al	O	N	T、Nb、Ta、Zr	Ti+Nb+Ta+Zr	ソーキング処理の有無
発明鋼	A	0.20	0.3	0.2	0.017	0.002	–	14.4	0.1	0.7	0.017	0.0010	9	–	–	有
	B	0.37	0.5	0.2				12.0	0.2	0.9			28			有
	C	0.24	0.2	0.4	0.023	0.001	0.40	13.6	0.2	0.8	0.020	0.0018	13	Nb:0.30	0.30	有
	D	0.34	0.5	0.1	–	–	0.12	13.9	0.3	0.8	–	–	81	Nb:0.10 Ti:0.10	0.20	有
	E	0.28	1.0	0.3			0.08	15.0	0.2	0.9			6			有
	F	0.21	0.5	0.8	0.030	0.002	0.13	13.6	0.3	0.4	0.018	0.0019	72			有
	G	0.33	0.2	0.8				13.2	0.0	0.9			100	Zr:0.21	0.21	有
	H	0.31	0.9	0.2	0.025	0.003	0.08	12.1	0.2	0.6	0.018	0.0011	62	–	–	有
	I	0.40	0.3	0.9	0.009	0.001	0.09	14.4	0.4	0.7	0.019	0.0060	23	–	–	有
	J	0.38	0.8	1.0	0.014	0.002	–	12.2	0.4	0.1	0.034	0.0018	8	Ta:0.02	0.02	有
	K	0.26	0.5	0.6			0.12	13.5	0.3	0.3	–	–	16			有
	L	0.36	0.7	0.1	0.010	0.001	–	14.0	0.2	0.2	0.019	0.0022	61	Ti:0.10	0.10	有
	M	0.29	0.9	0.8	0.015	0.008	0.04	12.5	0.3	0.6	0.020	0.0014	58			有
比較鋼	N	0.30	0.7	0.4	0.013	0.002	0.14	18.2	0.3	0.9	0.021	0.0041	19			有
	O	0.25	0.5	0.7	0.011	0.002	0.10	13.3	0.3	0.3	0.059	0.0032	97			有
	P	0.23	0.6	0.6	0.009	0.001	0.12	14.7	0.1	0.5	0.019	0.0008	57			無
	Q	0.38	0.5	0.8	0.010	0.001		14.3	0.6	0.2			86			有
	R	0.61	0.7	0.4	0.022	0.002	0.16	13.1	0.2	0.2	0.024	0.0016	21			有
	S	0.34	0.6	0.1	0.030	0.005	0.12	14.7	0.3	0.3	0.026	0.0014	84			無
	I	0.34	0.5	0.1	0.026	0.002	0.16	12.4	0.0	0.8	0.030	0.0019	250	–	–	有
	U	0.35	0.2	0.6	0.010	0.001	0.11	12.3	0.4	0.6	0.021	0.0170	73	–	–	無
	V	0.27	0.9	0.6	–	–	0.17	14.7	0.3	1.0	0.025	0.0015	4	–	–	有
	W	0.50	0.6	0.4	0.014	0.001	0.12	13.5	0.3	0.9	0.019	0.0009	66	–	–	有
	X	0.40	0.3	0.9	0.027	0.001	0.19	14.4	0.4	0.7	0.024	0.0023	23	–	–	無
	Y	0.38	0.8	1.0	–	–	–	12.2	0.4	0.1	0.020	0.0006	8	–	–	無
	Z	0.34	0.4	0.6	0.014	0.003	0.25	12.5	0.3	0.3	0.018	0.0012	54	Nb:0.45	0.45	有

網掛け部は請求の範囲を外れる。

"

区分　Types of steels

発明鋼　Steels of the Inventions

比較鋼　Steels of the comparative examples

ソーキング処理の有無　　with or without soaking treatment

有　　with soaking treatment

無　　without soaking treatment

網掛け部は請求の範囲を外れる。　Shaded areas do not fall under the scope of the

claims.

(G) "[0042]
[Table 2]

区分	No.	炭化物粒径（μm）	炭化物数	炭化物数の差	面粗さRa	WSm
発明鋼	A	3	78	12	○	○
	B	4	160	19	○	○
	C	2	102	13	○	○
	D	5	154	24	○	○
	E	4	153	22	○	○
	F	3	61	13	○	○
	G	3	152	21	○	○
	H	3	93	14	○	○
	I	5	160	30	○	○
	J	4	18	16	○	○
	K	3	41	13	○	○
	L	4	40	23	○	○
	M	5	87	14	○	○
比較鋼	N	6	196	40	×	×
	O	2	43	28	×	○
	P	3	71	34	○	×
	Q	6	54	28	×	○
	R	8	73	39	×	×
	S	5	56	43	○	×
	T	5	138	21	×	○
	U	5	104	36	×	×
	V	4	161	23	×	○
	W	7	239	38	×	×
	X	6	160	50	×	×
	Y	5	18	35	○	×
	Z	4	51	16	×	○

"

区分　Types of steels
発明鋼　Steels of the Inventions
比較鋼　Steels of the comparative examples
炭化物粒径　Particle Diameter of Carbide
炭化物数　Number of Carbide Particles
炭化物数の差　Difference in Number of Carbide Particles
面粗さ　Surface roughness

B According to the aforesaid A(A) to (B), A(D) to (G), for solving the problem of the aforesaid item (1)B, it is recognized that the contents of C and Cr should be adjusted to C: 0.20 to 0.40% and Cr: 12.0 to 15.0% by mass and the following three requirements should be satisfied to ensure corrosion resistance and high specularity:
1) as a carbide and a carbonitride precipitated and contained in the steel, a particle diameter of the carbonitride is 5 μm or less;
2) the number of carbide particles per 100 μm-square in the roll surface of the steel is 160 or less; and
3) the difference in the number of carbide particles per 50 μm-square in 300 μm-square of the roll surface of the steel between a number of a maximum part and a number of a minimum part is 30 or less.

C Further, according to the above item (C), it is recognized that P, S, Al, and O are components that deteriorate toughness, or deteriorate specularity, and these elements are components which are not contained in the steel according to the Inventions 1 to 8, or whose contents should be desirably reduced as possible.

(3) Whether or not a person ordinarily skilled in the art can recognize that a problem of the aforesaid (1)B may be solved by the Inventions 1 to 8
A The Inventions 1 to 8 satisfy the contents of C and Cr necessary for the corrosion resistance as shown in the aforesaid item (2)B, and all the matters for specifying the invention of three requirements necessary for high specularity.

B Therefore, the Inventions 1 to 8 fall within a scope where a person skilled in the art could recognize that the problem might be solved, and conform to the requirement provided in Article 36(6)(i) of the Patent Act.

C Here, consideration is given to the Inventions 1, 3, 5 and 7, in which the contents of P, S, Al, and O are not specified.

The Inventions 1, 3, 5, and 7 are as specified in the aforesaid No. 3, all of which are specified as below:
"The steel comprising ..., and the balance consisting of Fe and inevitable impurities"
("..." represents an omission.). Therefore, they are so-called closed-ended claims that exclude an intentional inclusion of other active ingredients.

Further, as in the aforesaid (2)C, the elements P, S, Al, and O are components that deteriorate toughness or specularity, and thus these elements are components which are preferably excluded in the steel according to the Inventions 1 to 8, or whose contents should be preferably reduced as possible. Therefore, in the closed-ended claims of the Inventions 1, 3, 5, and 7, in which the contents of P, S, Al, and O are not specified, it is reasonable to construe that P, S, Al, and O are refrained from being intentionally included; i.e., the contents are below the detection limits.

The aforementioned concept is evident from Table 1 of the aforesaid (F) and Table 2 of (G), which includes:
"B" as an example of the Invention 1;
"E" as an example of the Invention 3;
"G" as an example of the Invention 5;
"D" as an example of the Invention 7;

in which the contents of P, S, Al, and O for these examples are "-".

D Consequently, the Inventions 1, 3, 5 and 7 fall within a scope where a person skilled in the art could recognize that the problem might be solved.

E Even if there is room to construe that the Inventions 1, 3, 5, and 7 comprise P, S, Al, and O as "inevitable impurities" in view of the common general knowledge in the technical field of steels that P, S, Al, and O are contained as inevitable impurities in a production process of steel, as in the aforesaid (2)C, the elements P, S, Al, and O are components that deteriorate toughness or specularity, and thus these elements are components which are not contained in the steel according to the Inventions 1 to 8, or whose contents should be desirably reduced as possible. Accordingly, when the steels subject to the Inventions 1, 3, 5, and 7 comprise these components to an extent that goes beyond the upper limits described in the aforesaid A(C), these components can be no longer "inevitable impurities" in the Inventions 1, 3, 5, and 7. Therefore, it is reasonable to understand that the Inventions 1, 3, 5, and 7, in which these contents are not definitely specified, do not comprise ones that go beyond the contents of "P: 0.030% or less, S: 0.010% or less, Al: 0.05% or less, and O: 0.0100% or less".

No. 5 Closing

As described above, the present application cannot be rejected on the reason of the examiner's decision.

Further, no other reason for rejection is found in the present application.

Therefore, the appeal decision shall be made as described in the conclusion.

June 4, 2018

Chief administrative judge: ITAYA, Kazuhiro
Administrative judge: YUKI, Saori
Administrative judge: HASEYAMA, Ken