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**Datasheet for the decision
of 20 April 2023**

Case Number: T 0552/21 - 3.3.05

Application Number: 09813166.7

Publication Number: 2327810

IPC: C22C38/06, C22C38/60, C21D9/46

Language of the proceedings: EN

Title of invention:
HIGH-STRENGTH STEEL SHEET AND METHOD FOR PRODUCTION THEREOF

Patent Proprietor:
JFE Steel Corporation

Opponent:
ArcelorMittal

Headword:
HIGH-STRENGTH STEEL SHEET/JFE Steel

Relevant legal provisions:
EPC Art. 84
RPBA 2020 Art. 13(2)

Keyword:
Claims - clarity after amendment (no)
Amendment after summons - exceptional circumstances (no)

Decisions cited:

G 0003/14

Catchword:



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Case Number: T 0552/21 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 20 April 2023

Appellant: ArcelorMittal
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
12 March 2021 concerning maintenance of the
European Patent No. 2327810 in amended form.**

Composition of the Board:

Chairman E. Bendl
Members: J. Roider
P. Guntz

Summary of Facts and Submissions

- I. The appeal by the opponent lies from the opposition division's interlocutory decision to maintain the patent in amended form based on the then auxiliary request 1, the present main request.
- II. The following document, which was already cited in the opposition proceedings, is relevant here:

D2 EP 2 155 915 B1

- III. Main request

Claims 1 and 3 of the main request read as follows (amendments with respect to the claims as granted are marked):

1. A high strength steel sheet characterized by having a composition consisting of, on a percent by mass basis,

C: 0.17% or more, and 0.73% or less;

Si: 3.0% or less;

Mn: 0.5% or more, and 3.0% or less;

P: 0.1% or less;

S: 0.07% or less;

Al: 3.0% or less; and

N: 0.010% or less,

while it is satisfied that Si + Al is 0.7% or more, optionally comprising at least one type of element selected from

Cr: 0.05% or more, and 5.0% or less;

V: 0.005% or more, and 1.0% or less;

Mo: 0.005% or more, and 0.5% or less;

Ti: 0.01% or more, and 0.1% or less;
Nb: 0.01% or more, and 0.1% or less;
B: 0.0003% or more, and 0.0050% or less;
Ni: 0.05% or more, and 2.0% or less;
Cu: 0.05% or more, and 2.0% or less;
Ca: 0.001% or more, and 0.005% or less;
REM: 0.001% or more, and 0.005% or less;
and the remainder includes Fe and incidental impurities, wherein regarding the steel sheet microstructure, it is satisfied that the area percentage of a total amount of lower bainite and whole martensite is 10% or more, and 90% or less relative to the whole steel sheet microstructure, the amount of retained austenite is 5% or more, and 50% or less, the area percentage of bainitic ferrite in upper bainite is 5% or more relative to the whole steel sheet microstructure, as-quenched martensite is 75% or less of the total amount of lower bainite and whole martensite, and the area percentage of polygonal ferrite is 10% or less (including 0%) relative to the whole steel sheet microstructure, the average amount of C in the retained austenite is 0.70% or more, and the tensile strength is 980 MPa or more.

3. A method for manufacturing a high strength steel sheet, characterized by comprising the steps of hot-rolling a billet having a component composition according to Claim 1, conducting cold-rolling so as to produce a cold-rolled steel sheet, annealing the resulting cold-rolled steel sheet for 15 seconds or more, and 600 seconds or less in an austenite single phase region and, thereafter, conducting cooling to a cooling termination temperature: T °C determined in a first temperature range of 350 °C or higher, and 490 °C or lower, wherein cooling to at least 550 °C is conducted while the average cooling rate is controlled

at 5 °C/s or more, subsequently, keeping is conducted in the first temperature range for 15 seconds or more, and 1,000 seconds or less and, ~~then, keeping is conducted in~~ after keeping in the first temperature range is completed, the resulting steel sheet is cooled to a second temperature range of 200 °C or higher, and 350 °C or lower, and keeping is conducted in the second temperature range for 15 seconds or more, and 1,000 seconds or less.

IV. Auxiliary request 1

Claim 1 is unamended with respect to the main request.

Claim 3 reads as follows (amendment with respect to claim 3 as granted is marked):

3. A method for manufacturing a high strength steel sheet, characterized by comprising the steps of hot-rolling a billet having a component composition according to Claim 1, conducting cold-rolling so as to produce a cold-rolled steel sheet, annealing the resulting cold-rolled steel sheet for 15 seconds or more, and 600 seconds or less in an austenite single phase region and, thereafter, conducting cooling to a cooling termination temperature: T °C determined in a first temperature range of 350 °C or higher, and 490 °C or lower, wherein cooling to at least 550 °C is conducted while the average cooling rate is controlled at 5 °C/s or more, subsequently, keeping is conducted in the first temperature range for 15 seconds or more, and 1,000 seconds or less and, then, keeping is conducted in a second temperature range of 200 °C or higher, and ~~350~~ 340 °C or lower for 15 seconds or more, and 1,000 seconds or less.

Dependent claims 2 and 4 concern particular embodiments of the invention.

- V. The appellant's key arguments can be summarised as follows:

Main request, clarity

The subject-matter of claim 3 lacked clarity because the step of keeping the temperature of the steel sheet within the claimed ranges did not require the temperature to be held constant during the respective holding steps but, in line with paragraph [0075], merely required the the temperature to fall within the claimed range for 15 to 1 000 seconds.

Since the temperature of 350 °C was the lower limit of the first (higher) temperature range and also the upper limit of the second (lower) temperature range, there was no cooling step between these temperature ranges. Since a temperature close to 350 °C fell either within the first or the second temperature range, there was no room for a cooling step. Therefore, the cooling step, which was the added feature, was unclear.

Main request, admission of the new novelty objection

During the preparation for the oral proceedings before the board, it became apparent that the subject-matter of claim 3 was not novel over D2, example I2-c, because it showed in table 2, *inter alia*, that the cooling from 400 °C to 200 °C was carried out at a rate of 5 °C/s such that the steel sheet was kept within the temperature range between 200 °C and 350 °C for 30 seconds. Since it was straightforward to verify that the other features of claim 3 were also anticipated by D2, the subject-matter of claim 3 lacked novelty.

Auxiliary request 1, admission of the new objection under Article 123(3) EPC

During the preparation for the oral proceedings before the board, it also became apparent that auxiliary request 1 infringed the requirements of Article 123(3) EPC. With respect to the patent as granted, claim 3 of auxiliary request 1 was amended to reduce the upper limit of the second temperature range from 350 °C to 340 °C.

Unlike the granted patent, auxiliary request 1 thus also covered processes which kept the temperature of the steel sheet at a temperature between 340 °C and 350 °C for 100 seconds and subsequently between 200 °C and 340 °C for 1000 seconds, which was a total of 1100 seconds within a temperature range of 200 °C and 350 °C.

- VI. The respondent's (proprietor's) key arguments can be summarised as follows:

Main request, clarity

The step of keeping the temperature of the steel sheet was, apart from temperature fluctuations, carried out at a constant temperature. The cooling step required active cooling to change the temperature of the steel sheet. The steps required according to the claims were thus clearly distinguishable and did not introduce a lack of clarity.

Admission of new objections against the main request and auxiliary request 1

The respondent requested that these objections not be admitted because they were raised for the first time at the oral proceedings before the board, although both the main request and auxiliary request 1 were already filed during the opposition proceedings. They should

thus not be admitted according to Article 13(2) RPBA 2020.

VII. Requests as to the substance:

- (a) The appellant (opponent) requested that the decision under appeal be set aside and that the European patent be revoked.
- (b) The respondent (patent proprietor) requested that the appeal be dismissed or, in the alternative, that the patent be maintained in amended form based on one of auxiliary requests 1 to 4, submitted with the reply to the statement setting out the grounds of appeal.

Reasons for the Decision

1. Main request, clarity, Article 84 EPC

The objection is directed against the amendment concerning the cooling step in claim 3, after the step of keeping the temperature of the steel sheet in the first temperature range, for cooling the steel sheet to the second temperature range. This feature was added during the opposition proceedings and originates from the description (paragraph [0056] of the application as originally filed).

Therefore, the objection under Article 84 EPC against this feature may be examined (G 3/14).

Corresponding clarity objections were raised in the opposition proceedings on 27 November 2020 against the then auxiliary request 3 (corresponding to the claims as maintained by the opposition division, i.e. the

present main request), which were repeated in the grounds of appeal.

The subject-matter of claim 3 stipulates that during the keeping steps, the temperature of the steel sheet is kept within the claimed temperature ranges. As long as the temperature is within a claimed range, temperature changes due to cooling do not have the consequence that the temperature of the steel sheet must be considered as not being kept within the claimed temperature range.

The respondent's interpretation that keeping the temperature of the steel sheet was conducted at an essentially constant temperature but excluded times in which the steel sheet was cooled is not in line with the wording of the subject-matter of claim 3. Claim 3 does not require keeping the temperature of the steel sheet within the claimed temperature range to be carried out at a constant temperature.

The first and the second temperature ranges share the temperature of 350 °C. Therefore, cooling cannot be carried out to get from the first temperature range to the second.

The added feature of cooling the steel sheet to the second temperature range after keeping its temperature within the first temperature range is thus unclear (Article 84 EPC).

2. Admission of the new objections

As acknowledged by the appellant, the new objection against the novelty of the main request in view of D2, example I2-c, and the new objection against auxiliary

request 1 under Article 123(3) EPC were raised for the first time at the oral proceedings before the board.

These objections constitute amendments to the appeal case in the sense of Article 12(2) and (4) RPBA 2020. According to Article 13(2) RPBA 2020, any amendments to a party's appeal case will, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons.

There were no new or unforeseeable developments in the appeal proceedings. The discovery of an overlooked promising attack (main request) or deficiency (auxiliary request 1) during the preparation for the oral proceedings before the board does not qualify as exceptional circumstances.

Therefore, the new objections are not taken into account (Article 13(2) RPBA 2020).

3. Apart from the non-admissible objection under Article 123(3) EPC, no other objection was raised by the appellant against the first auxiliary request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent in amended form on the basis of the first auxiliary request submitted with the reply to the grounds of appeal and a description to be adapted.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated