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**Datasheet for the decision  
of 15 June 2018**

**Case Number:** T 0195/15 - 3.2.08  
**Application Number:** 00915519.3  
**Publication Number:** 1088905  
**IPC:** C22C38/04, C22C38/06, C21D9/46,  
C21D8/04  
**Language of the proceedings:** EN

**Title of invention:**

STEEL SHEET FOR ULTRA-THIN TWO-PIECE CANS HAVING EXCELLENT  
ANTI-WRINKLING PROPERTIES AND METHOD FOR PRODUCING THEREOF

**Patent Proprietor:**

Nippon Steel & Sumitomo Metal Corporation

**Opponent:**

ArcelorMittal France

**Headword:**

**Relevant legal provisions:**

EPC Art. 100(a), 54, 56

**Keyword:**

Novelty - (yes)  
Inventive step - (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0  
Fax +49 (0)89 2399-4465

Case Number: T 0195/15 - 3.2.08

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.08**  
**of 15 June 2018**

**Appellant:** ArcelorMittal France  
(Opponent) 5, rue Luigi Cherubini  
93212 La Plaine St Denis Cedex (FR)

**Representative:** Plaisant, Sophie Marie  
ArcelorMittal France  
Research & Development Intellectual Property  
Immeuble Le Cézanne  
6, rue André Campra  
93212 La Plaine Saint-Denis (FR)

**Respondent:** Nippon Steel & Sumitomo Metal Corporation  
(Patent Proprietor) 6-1, Marunouchi 2-chome  
Chiyoda-ku  
Tokyo 100-8071 (JP)

**Representative:** Vossius & Partner  
Patentanwälte Rechtsanwälte mbB  
Siebertstrasse 3  
81675 München (DE)

**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
20 November 2014 concerning maintenance of the  
European Patent No. 1088905 in amended form.**

**Composition of the Board:**

**Chairman** M. Alvazzi Delfrate  
**Members:** C. Herberhold  
Y. Podbielski

## **Summary of Facts and Submissions**

- I. By decision posted on 20 November 2014 the Opposition Division decided that European patent No. 1088905 as per the first auxiliary request then on file, and the invention to which it related, met the requirements of the EPC.
- II. The appellant (opponent) lodged an appeal against that decision in the prescribed form and within the prescribed time limit.
- III. Oral proceedings before the Board were held on 15 June 2018.

As announced by letter dated 30 May 2018 the appellant did not attend. In accordance with the provisions of Rule 115(2) EPC and Article 15(3) RPBA, the proceedings were continued without them.

The requests of the parties were as follows:

The appellant requested - in writing - that the decision under appeal be set aside and the patent be revoked.

The respondent (patent proprietor) requested as its main and only request that the decision under appeal be set aside and the patent be maintained on the basis of:

- claims 1 to 2 filed on 12 August 2015
- pages 1-5 and 7 of the description filed during oral proceedings before the opposition division
- page 6 of the description filed on 12 August 2015 and
- figure 1 of the patent specification.

IV. Independent claim 1 of the main request (apart from minor editorial changes corresponding to claim 1 of auxiliary request 1 found allowable by the Opposition Division) reads as follows:

"A method for producing a steel sheet for a two-piece can having excellent neck wrinkling resistance and anti-earing properties, characterized by:  
said steel sheet containing, in weight percent,  
C: 0.08% or less,  
Si: 0.05% or less,  
Mn: 0.04 - 0.4%,  
P: 0.04% or less,  
S: 0.04% or less,  
Al: 0.02 - 0.10%, and  
N: 40ppm or less with the balance being Fe and unavoidable impurities;  
carrying out hot rolling at a slab reheating temperature in the range of 1150 - 1250°C and at a hot-rolling coiling temperature in the range of 690 - 750°C, cold-rolling with a cold-rolling reduction ratio in the range of 90-94%, annealing at a temperature in the range of 650-670°C, and re-cold-rolling with a re-cold-rolling reduction ratio in the range of 1 - 10;  
and the average diameter of AlN with a diameter of at least 0.005µm being 0.01 to 0.10µm,  
the ratio of the number of AlN with a diameter of 0.01µm or less to the number of AlN with a diameter of at least 0.005µm being 10% or less,  
the average diameter of MnS with a diameter of at least 0.005µm being 0.03 to 0.40µm,  
the ratio of the number of MnS with a diameter of 0.03µm or less to the number of MnS with a diameter of at least 0.005µm being 50% or less,  
the following equation being satisfied,

(N existing as AlN)/(N content)>0.5, and the thickness of said steel sheet being 0.19mm or less."

V. The following documents played a role in the present decision:

D1: JP-A 09 104 920, including PAJ abstract and Automatic Translation of the Japanese text;

D2: Gérard Béranger et al., "LE LIVRE DE L'ACIER", Editeurs Scientifiques, Paris, 1298-1300, Sept. 1994;

D3: EP-B1-0 521 808.

VI. The essential arguments, presented by the appellant in writing, can be summarised as follows:

*Novelty*

Document D1 described a production method for steel used in packaging, the steel having a composition overlapping with the one claimed, see D1, abstract, table 1, examples A-E and H. Also the process parameters claimed overlapped with the ones indicated in D1, which disclosed in particular a slab reheating temperature between 1000 and 1250°C, a hot-rolling coiling temperature between 600° and 750°, a first cold rolling reduction rate of 80-98%, preferably 83-92%, an annealing temperature preferably between 680 and 780°C and a re-cold-rolling reduction ratio below 20%, preferably below 10%.

The sub-range claimed for the slab reheating temperature did not exhibit a particular technical effect and was a common choice for the skilled person,

as evidenced by D2, page 1298. Likewise, the hot-rolling coiling temperature, the cold-rolling reduction ratio, the annealing temperature, and the re-cold-rolling reduction ratio were chosen within the standard range, see D2, page 1299-1300 for the coiling temperature. The respective particular sub-ranges claimed did not exhibit any particular technical effect and were thus arbitrary.

In such a situation it was without relevance that the examples given in D1 did not fall within the claimed ranges. The decisive point was that the three criteria established in the case law for selection inventions were not fulfilled. Indeed, this had also been accepted by the opposition division in point 3 of the decision, where they stated that the steel composition and the process steps disclosed in D1 led to the product initially claimed.

Consequently, the subject-matter claimed could not be considered novel.

*Inventive step*

In any case, the subject-matter of claim 1 was not inventive over D1 in combination with the teaching of document D3.

The latter document disclosed a method for producing steel sheets for a two-piece can, the process comprising double cold rolling reduction with intermediate annealing for the fabrication of a sheet with a thickness below 0.20 mm. Furthermore, the steel used in D3 had a composition as in the attacked patent and the process comprised a hot-rolling coiling temperature over 650°C, with 710°C explicitly disclosed

in paragraph [0012], and an annealing temperature below 700°C, with 660°C being explicitly disclosed in paragraph [0013]. The document thus gave a clear indication to the person skilled in the art, firstly, which temperature ranges to choose for hot-rolling coiling and annealing, and secondly taught that steel sheets with a thickness below 0.20 mm could be produced by the double-cold-rolling process. In that context, the differences pointed out during the opposition proceedings with regard to the slab reheating temperature and the first cold rolling reduction rate were too low to have a technical effect, such an effect being anyway not disclosed. Likewise, the range claimed for the annealing temperature was not justified by any technical effect and working within that range would be considered by the skilled person as an obvious choice.

Therefore, the subject-matter of claim 1 did not involve an inventive step in view of D1 in combination with D3.

VII. The essential arguments of the respondent can be summarised as follows:

*Novelty*

The subject-matter of claim 1 was novel, at least because the annealing temperature indicated in D1, paragraph [0030] was outside the definite distinction claimed.

*Inventive step*

The invention related to a method for producing a steel sheet used as a material for a can produced by drawing, ironing, stretching and succeeding diameter reduction,



capable of being produced with high productivity, small earing and good neck wrinkling resistance.

Document D1 did not provide such kind of material, which was the result of the very specific process steps claimed in the patent. In addition to the different annealing temperature, the claim defined considerably narrower ranges for the slab reheating temperature, for the hot-rolling coiling temperature, as well as for the cold rolling reduction ratio and the re-cold-rolling reduction ratio.

Furthermore, none of the examples of D1 fell within the range claimed.

These technical differences mentioned resulted in small earing and good neck wrinkling resistance.

Document D3 was silent on any of these effects. Therefore, the skilled person had no reason to take its teaching into account. Furthermore, the process described in D3 was applied on steel having a composition with a lower Al content. While it was true that lower annealing temperatures were applied in D3, document D1 clearly taught away from the use of annealing temperatures below 680°C. Moreover, the particular process of D3 with an annealing temperature in the claimed range employed a considerably higher re-cold-rolling reduction rate.

The person skilled in the art would thus have had no reason to modify the D1 process using information from the process described in document D3, which firstly did not relate to the objective problem of the invention, and which secondly was applied to steel sheets having a different composition. Even if the process was taken

into account, there was no reason to use only some of the process parameters disclosed therein, while conveniently disregarding others.

Consequently, the subject-matter of claim 1 involved an inventive step.

### **Reasons for the Decision**

1. The invention relates to a method of producing a steel sheet with small earing and good neck wrinkling resistance for production of ultra-thin 2-piece cans by drawing, ironing and stretching (paragraph [0001]).

The properties of the sheet result from the composition and the production method.

The production method essentially comprises the following steps:

- re-heating to a slab reheating temperature,
- hot rolling,
- hot-rolling-coiling,
- first cold-rolling,
- annealing,
- and re-cold rolling.

2. Novelty

Document D1 discloses a steel with a composition falling under the definition of claim 1 (D1, abstract and paragraph [0007]-[0019]; Table 1, examples A-D, H). This steel is treated by a production method comprising the process steps mentioned in point 1 above (abstract and paragraphs [0020]-[0031]).

However, whereas claim 1 of the patent defines the annealing temperature to be between 650°C and 670°C, D1 discloses a range of 680-780°C (paragraph [0030]) for the annealing temperature, the explicit examples being 720°C (paragraph [0032], last sentence) and 700°C (paragraph [0037]).

The range claimed for the annealing temperature is thus disjunct with the range disclosed in D1, i.e. it is neither a selection from a broader range in the prior art, nor do the ranges overlap. Therefore, the case law developed for judging novelty of a selection of parameter ranges does not apply and annealing in the claimed range is a distinguishing feature with respect to D1.

The appellant further argued that the Opposition Division at the end of point 3 of the impugned decision had acknowledged D1 to provide the same steel composition as well as process steps directly responsible for achieving the claimed microstructure. Indeed, this led to the Opposition Division's finding that claim 1 as granted (which was directed to the steel sheet as such) was not novel. The fact that two processes lead to the microstructure claimed does, however, in no way exclude that the processes from which it results are different, e.g. in that they employ different process parameters, such as the different annealing temperature used in the present case.

Hence, as D1 does not clearly and unambiguously disclose a method for producing a steel sheet comprising annealing between first and second cold rolling at a temperature in the range of 650-670°C, the subject-matter of claim 1 is novel.

3. Inventive step

3.1 D1 discloses a method for producing a thin steel sheet (e.g. 0,19 mm, see paragraph [0037]) for cans ("steel-for-can board", see paragraph [0003]) and can be considered a suitable closest prior art.

3.2 As discussed in point 2 above, D1 does not disclose annealing between first and second cold rolling at a temperature in the range of 650-670°C. Furthermore, the temperature ranges claimed for the hot rolling temperature (1150°-1250°C) and for the coiling temperature (690°-750°C) define sub-ranges of the respective ranges disclosed in D1 (slab reheating temperature: D1, no general disclosure, however 1000-1250°C being mentioned for example 1, see paragraph [0032] first sentence; coiling temperature: 600-750°C, see paragraph [0028], last line).

With respect to the examples of D1, none discloses a combination of a slab reheating temperature and a coiling temperature in the claimed range (see Table 3).

3.3 According to the patent the claimed process results in small earing and good neck wrinkling resistance, thus solving the problem to restrain wrinkle formation and heat-buckling thereby improving production efficiency.

3.4 The appellant argued that the claimed parameter ranges were conventional and did not have any technical effect.

The Board, however, notes that the patent provides experimental data in Table 2. That table shows the examples having a higher annealing temperature (AT) than claimed (i.e. 680° or 700°C, see Table 2, lines 1

and 6, steel a and e) to exhibit heat-buckling and (for steel a) also a relatively high earing ratio. Furthermore, raising the coiling temperature (CT) and lowering the annealing temperature to the respective claimed ranges did improve the earing ratio. There is thus evidence of the claimed parameters having a favourable influence on earing ratio and heat-buckling. No evidence to the contrary was provided by the appellant in this respect.

The appellant's argument that the claimed parameter ranges were arbitrary and did not involve any technical effect is thus to be rejected.

3.5 D3 discloses a steel composition and a method of producing a steel sheet having favourable mechanical properties in the forming operations also used in D1 and in the patent. It is thus assumed in the appellant's favour that the person skilled in the art would at least consider the teaching of document D3 when aiming to solve the problem posed.

However, the composition used in D3 defines an Al content (D3, claim 1,  $Al \leq 0.014\%$ ; examples, paragraphs [0010], [0018]: Al = 0.008%, 0.014%, 0.013%) not falling within the range claimed (Al: 0.02-0.1%). Furthermore, the re-cold-rolling-reduction ratio in the examples (paragraph [0013]) is 22%  $((0.23\text{mm}-0.18\text{mm})/0.23\text{mm})$ , i.e. larger than the 1-10% claimed. The person skilled in the art would thus have to apply a method disclosed for a different steel composition than the one claimed. He/she would further have to use some of the process parameters of D3 (such as the lower annealing temperature) in combination with some of the process parameters of D1 (i.e. for the re-cold-rolling-reduction ratio), without any motivation to do

so by the teaching of the documents. The Board considers this exercise to be a clear hindsight driven *a posteriori* approach.

This analysis does not change when the teaching of D2 is taken into account. D1 and D3 define parameter ranges which are much more narrow than the very general indications as to the "order of magnitude" given in D2 ("ordres de grandeur", see page 1298, second paragraph). Only by use of hindsight could the person skilled in the art cherry-pick process parameters within the claimed ranges from the teachings of D1, D2 and D3 as needed.

Consequently, the method claimed involves an inventive step.

## 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 on the basis of:

- claims 1 to 2 filed on 12 August 2015
- pages 1-5 and 7 of the description filed during oral proceedings before the opposition division
- page 6 of the description filed on 12 August 2015 and
- figure 1 of the patent specification.

The Registrar:

The Chairman:



C. Moser

M. Alvazzi Delfrate

Decision electronically authenticated