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**DECISION**  
**of 28 July 2004**

**Case Number:** T 0572/02 - 3.2.2

**Application Number:** 96913297.6

**Publication Number:** 0883696

**IPC:** C22C 38/12

**Language of the proceedings:** EN

**Title of invention:**

Bake hardenable vanadium containing steel

**Patentee:**

BETHLEHEM STEEL CORPORATION

**Opponent:**

Thyssen Krupp Stahl AG

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 54

**Keyword:**

"Novelty (no) "

**Decisions cited:**

-

**Catchword:**

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Case Number: T 0572/02 - 3.2.2

**DECISION**  
of the Technical Board of Appeal 3.2.2  
of 28 July 2004

**Appellant:**  
(Proprietor of the patent)

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(Opponent)

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**Decision under appeal:**

Decision of the Opposition Division of the  
European Patent Office posted 28 March 2002  
revoking European patent No. 0883696 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** T. K. H. Kriner  
**Members:** R. Ries  
A. Pignatelli

## Summary of Facts and Submissions

- I. The grant of the European patent No. 0 883 696 was published on 1 September 1999.
- II. The granted patent was opposed by the present respondent on the grounds that its subject matter lacked novelty and did not involve an inventive step with respect to the state of the art (Article 100(a) EPC).
- III. With its decision posted on 28 March 2002, the opposition division held that the claimed subject matter according to the main request and the auxiliary requests I to III lacked novelty and revoked the patent.
- IV. An appeal against this decision was filed by the patentee (the appellant) on 3 June 2002. The fee for appeal was paid simultaneously and the written statement setting out the grounds of appeal was filed within the time limit given in Article 108 EPC on 7 August 2002.
- V. Of the pre-published documents considered in the opposition proceedings, only the following have still been relied upon on appeal:

D1: EP-A-780 480

D2: V. Krupic et al. : « Vanadium in interstitial-free steels », 37th Mechanical Working and Steel Processing Conference, Hamilton, Ontario, Canada, 22 to 25 October 1995, 9 pages

D3: WO-A-96/14444

- VI. In an official communication annexed to the summons to attend oral proceedings the Board's provisional position was explained, in particular putting into doubt the novelty of the claimed subject matter vis-à-vis the technical teaching given in documents D1 to D3.
- VII. Oral proceedings were held on 28 July 2004. Although duly summoned, none of the parties were represented at the oral proceedings. In accordance with the provisions of Rule 71(2) EPC the proceedings were continued without the parties.

The following requests were made in the written proceedings:

- The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims as granted (main request) or, alternatively, on the basis of the claims according to the first to third auxiliary request, respectively.
- The respondent requested that the appeal be dismissed

- VIII. Independent Claims 1 and 13 of the main request read as follows:

"1. Rolled steel article consisting essentially of by weight percent:

0.0005 to less than 0.1% carbon;

between zero and up to 2.5% manganese;

between zero and up to 0.5% aluminium;  
between zero and up to 0.5% of a nitride forming  
element selected from the group consisting of boron,  
zirconium and titanium;  
between zero and less than 0.04% nitrogen;  
between 0.005 and less than 0.6% vanadium;  
between zero and up to 1.0% silicon and  
between zero and up to 0.25% phosphorus;  
with the balance being iron and inevitable impurities,  
characterized in that the ratio of vanadium to carbon  
is 10 or above."

"13. Method of making a rolled steel article comprising  
the steps of casting low carbon steel with a  
composition consisting essentially in wt% of  
0.0005 to less than 0.1% carbon;  
between zero and up to 2.5% manganese;  
between zero and up to 0.5% aluminium;  
between zero and up to 0.5% of a nitride forming  
element;  
between zero and up to 1.0% silicon and  
between zero and 0.25% phosphorus;  
between zero and less than 0.04% nitrogen and  
between 0.005 and less than 0.6% vanadium;  
with the balance being iron and inevitable impurities,  
and hot rolling said steel, characterized by  
maintaining a vanadium/carbon ratio on a value of ten  
or above in said steel to improve aging resistance."

Claim 1 and 13 of the first auxiliary request differ  
from the corresponding claims of the main request by  
the following additional features (in bold letters):

"1. Rolled steel article...or above and the rolled article includes interstitial solute".

"13. Method of ...aging resistance and form interstitial solute in the rolled steel article".

Claim 1 of the second and third auxiliary request corresponds to claim 13 of the main request and of the first auxiliary request, respectively.

IX. The appellant argued as follows:

The patent is directed to the provision of a rolled steel article and a method for producing such an article, e.g. steel strip, which is to exhibit a good formability, a high bake-hardenability and a sufficient aging resistance prior to the forming step. This balance of properties is achieved by the claimed steel composition. Specifically by adhering to a ratio  $V/C \geq 10$ , the aging resistance is significantly improved.

The claimed limitation of the  $V/C$  ratio is not disclosed in document D3 which represents prior art pursuant to Article 54(3) EPC. As to document D3, the question of issue is, therefore, confined to the novelty of the claimed subject matter. It is also noted that the European regional phase for this international PCT application (D3) has not been entered for Denmark (DK), Finland (FI) and Sweden (SE), and hence D3 is not relevant for these states. As to the preferred embodiments set out in document D3, the steel composition given in claim 1 covers a ratio  $V/C$  between 0.5 and 300. In claims 6 and 17 the  $V/C$  ranges from 2.22 to 5.1 and claim 19 discloses a  $V/C$  between 3 and

120. The composition according to claim 20 covers a ratio V/C between 6 and 120. Thus, document D3 discloses steel compositions in which the vanadium and carbon contents are merely chosen arbitrarily rather than on purpose.

It is not disputed that two of the exemplifying compositions disclosed in D3 comprise carbon and vanadium in amounts satisfying the claimed V/C ratio. However, these compositions fall by chance into the claimed range, and nothing in document D3 affords a person skilled in the art a better prospective as to the improvement of the aging resistance by selecting the specific V/C ratio, as does the patent. Moreover, document D3 is not directed to a manufacturing process itself set out in claim 13 of the patent, and neither provides the control of the  $V/C \geq 10$  as set out above. Hence, the subject matter of independent claims 1 and 13 as granted is novel vis-à-vis the disclosure of document D3.

Given this situation, the United States patent application US 607893 of which the present patent claims priority includes a new disclosure and, due to this new disclosure, represents the first application in the sense of Article 4 of the Paris convention. Contrary to the position of the opposition division, the priority has, therefore, been rightly claimed.

The independent claims set out in the auxiliary requests I to III basically correspond to claims 1 and 13 of the main request, consequently, the same arguments also apply to these claims.

X. The respondent argued as follows:

The subject matter set out in the claims of all requests is completely anticipated by the disclosure of document D1 and also of document D3 which concerns a PCT application filed in the name of the patentee. Given this situation, the priority claimed by the patent in suit cannot be considered as the "first application" within the meaning of Article 87(4) EPC and, therefore, the patent in suit is not entitled to the priority as claimed.

### Reasons for the Decision

1. The appeal is admissible.

2. Novelty

2.1 Main request

Like the patent at issue, document D3 is concerned with rolled articles such as hot and cold rolled and annealed steel sheet or strip. The low carbon steel composition stipulated in claims 1 and 13 includes effective amounts of vanadium to produce an improved bake-hardening effect to make the product especially suitable for automotive use. A comparison of the compositions reveals that document D3 likewise describes a steel which exhibits the same elemental ranges specified in claims 1 and 13 of the patent at issue. Specifically, steels no. 2 (0.0021 %C, 0.19 %Mn, 0.038 %Al, 0.0062 %N, 0.021 %Ti, 0.049 %V, balance Fe and residuals; V/C = 23,22) and no. 3 (0.0028 %C,



0.19 %Mn, 0.040 %Al, 0.006 %N, 0.021 %Ti, 0.094 %V, balance Fe and residuals; V/C = 33.57) disclosed in the Table on page 11, fall within the claimed ranges and satisfy the ratio of  $V/C \geq 10$ . Moreover, the rolled articles set out in claims 17 and 20 as well as the method set out in claims 6 and 19 of document D3 are within the claimed compositional ranges and meet the proviso of  $V/C \geq 10$  (D3: V/C = 12 to 30 for the composition specified in claim 19; V/C = 23,3 to 33,6 for the composition given in claim 17). Given that the ranges for carbon and vanadium in the known steel are selected for the same purpose as claimed in the patent at issue (i.e. to improve the bake-hardenability and aging resistance; cf. D3, page 8, second paragraph, page 11 last paragraph), the V/C ratio resulting from these ranges cannot be rated as arbitrarily chosen, as alleged by the appellant, even if the V/C ratio is not explicitly mentioned. Hence, the rolled articles and the method of making these articles disclosed in document D3 anticipate the subject matter of independent claims 1 and 13 as granted (main request).

The same finding is true for steel no. 3 given in Table 1 of document D1, and likewise for steels no. 3, 5 and 6 given in Table 1 of document D2. This assessment of the prior art D1 and D2 given in the Board's official communication has not been challenged by the appellant.

## 2.2 First auxiliary request

Claim 1 of the first auxiliary request further specifies that "*the rolled article includes interstitial solute*". As stated in paragraph [0047] of

the patent, vanadium (and in particular the ratio V/C) is used to control the level of solute carbon and to provide a suitable degree of bake-hardening.

The metallurgical expert, however, knows that the bake-hardening effect does not occur unless a minimum amount of interstitial elements (carbon and nitrogen) is present in solution. For corroboration only, the appellant is referred e.g. to document D2, page 6, right hand column, last paragraph, second sentence. Given that the steel compositions disclosed in the Table on page 11 of document D3 actually exhibit an increased bake-hardening effect, a certain amount of solute carbon and nitrogen is indispensable to bring about this improvement. This estimation is also confirmed by the statement given on page 12, lines 20 to 32 of document D3 which compares the characteristics of the steels set out in D3 with those of interstitial-free (IF) steels according to the prior art. The technical feature that "*the rolled steel article includes interstitial solute*" does, therefore, not effect a patentable distinction between the claimed subject matter and the subject matter of the prior art D3, D1 or D2 which likewise aim at improving the bake-hardening effect of rolled steel products.

The elemental ranges for silicon and phosphorus specified in independent claim 13 comply with those given in D3 on page 7, lines 10 to 20. Consequently, claims 1 and 13 according to the first auxiliary request do not comprise novel subject matter either.

2.3 Second and third auxiliary request

Claim 1 of the second and third auxiliary requests is restricted to the method of producing a rolled steel article and corresponds to method claim 13 of the main and first auxiliary request, respectively. Hence, the subject matter of these claims lacks novelty for the same reasons which are forwarded for method claim 13 of the main and the first auxiliary request, respectively.

3. As to the appellant's argument that document D3 is not relevant for the designated States Denmark (DK), Finland (FI) and Sweden (SE), evidence has been produced by the opponent in its response dated 21 March 2003 showing that the European regional phase for D3 actually has been entered also for (DK) and (SE). Given that this evidence has neither been disputed nor a request to restrict the patent to the designated States not covered by D3 has been submitted by the appellant, there is no need to deal with this issue or with the question whether the priority claimed in the patent at issue is valid.

Order

For these reasons it is decided that:

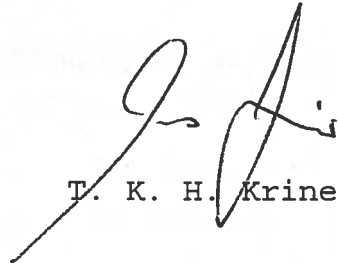
The appeal is dismissed.

The Registrar:



G. Magouliotis

The Chairman:



T. K. H. Kriner

