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**D E C I S I O N**  
**of 19 February 2002**

**Case Number:** T 1059/98 - 3.2.1  
**Application Number:** 86102364.6  
**Publication Number:** 0193155  
**IPC:** B21B 37/00, B21B 35/04, B21B 1/28

**Language of the proceedings:** EN

**Title of invention:**  
Continuous multi-stand mill plant for rolling steel plates

**Applicant/Patentee:**  
NIPPON STEEL CORPORATION

**Opponent:**  
Siemens AG  
SMS Schloemann-Siemag AG

**Headword:**

-

**Relevant legal provisions:**  
EPC Art. 21(1), 56, 104, 112(1)(a), 113(1), 123(2)  
EPC R. 67, 68(2)

**Keyword:**  
"Added subject-matter (no)"  
"Inventive step (yes)"  
"Substantial procedural violation (no)"  
"Referral of a question to the Enlarged Board of Appeal (refused)"  
"Competence for apportionment of costs in connection with the oral proceedings before the first instance"

**Decisions cited:**

J 0007/82, J 0012/85, T 0094/84, T 0970/93

**Catchword:**

A Board of Appeal is not competent to consider and decide upon a request for apportionment of costs incurred in respect of oral proceedings held before the opposition division unless a decision on this request has been taken by the opposition division (following decision J 0012/85, OJ EPO 1986, 155).



Case Number: T 1059/98-3.2.1

**D E C I S I O N**  
**of the Technical Board of Appeal 3.2.1**  
**of 19 February 2002**

**Appellant I:** Siemens AG  
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**Appellant II:** SMS Schloemann-Siemag AG  
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**Respondent:** NIPPON STEEL CORPORATION  
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**Decision under appeal:** Interlocutory decision of the Opposition Division  
of the European Patent Office posted  
8 October 1998 concerning maintenance of European  
patent No. 0 193 155 in amended form.

**Composition of the Board:**

**Chairman:** F. Gumbel  
**Members:** M. Ceyte



## Summary of Facts and Submissions

- I. The respondent is proprietor of European patent No. 0 193 155 (application No. 86 102 364.6).
- II. By its former decision posted on 20 September 1993 the opposition division rejected the oppositions filed by opponents 01 and 02. The opposition division took the view that the claimed subject-matter was patentable over inter alia the following prior art documents.
- D1: Article "Die elektrische Ausrüstung eines Kaltwalzwerkes in Norwegen" Brown Boveri Mitteilungen 10/11, 1973; pp. 479-483;
  - D3: Text of a lecture "Grundlagen und Begriffe der Umrichtertechnik sowie der allgemeinen Drehfeldmaschine" by H. Klautscheck presented publicly on 15 February 1984 at the Fort- und Weiterbildungszentrum of the Technische Akademie, Esslingen, pp. 1-5;
  - D7: Brochure "Ideas for steel" Siemens purportedly published in May 1982;
  - D9: Book "Cold Rolling of Steel" by W. Roberts, Dekker Inc., New-York and Basel, 1978, pp. 41-43.
- III. The appellants I and II (opponents 01 and 02) filed appeals against this decision.

During appeal proceedings appellant I cited inter alia the following additional document:

- D12: Brochure - "Ideas for Steel, Ideen und Innovation führen zur marktbestimmenden Konzeption...", Siemens, allegedly published in 1989.

Document D12 together with a drawing sheet numbered (3) E 53290-A-KB001A and a declaration signed by a witness, M. Jürgen Sauerland, were relied upon as evidence of an alleged prior use referred to in this decision as the "Wuhan" tandem mill.

- IV. In its decision T 970/93 of 15 March 1996 the Board 3.2.1 came to the conclusion that the "Wuhan" tandem mill was a public prior use and that the subject-matter of claim 1 was not novel over this public prior use. In view of the late submission of the evidence relating to this prior use, the Board ordered opponent 01 to reimburse the proprietor's costs incurred at the oral proceedings held before the Board. Having thus rejected the proprietor's main request, the Board remitted the case for further prosecution on the basis of pending auxiliary requests.
- V. By its interlocutory decision posted on 8 October 1998 the opposition division maintained the patent in amended form on the basis of the second auxiliary request filed before it.

The opposition division held that:

- the amendment in claims 1 and 2 "at least 4" was allowable under Article 123(2) EPC, and
- the subject-matter of claim 1 and that of independent claim 2 were patentable over inter

alia the "Wuhan" prior use and the additionally opposed document:

D15: Article "AC main drives for rolling mills" by G. Hauser and H. Wokush, Iron and Steel Engineer, Nov. 1984, pp. 27-33.

VI. The appellants I and II filed appeals against this decision on 6 November 1998 and 21 November 1998 respectively and paid the appeal fee on the same days. The statements of grounds of appeal were filed on 17 December 1998 and 8 February 1999 respectively.

VII. Oral proceedings before the Board were held on 19 February 2002.

Appellants I and II (opponents 01 and 02) requested that the decision under appeal be set aside and that the European be revoked in its entirety.

Additionally appellant I requested that:

- the appeal fee be reimbursed on the ground that the opposition division failed to consider prior art Document D3 in its decision;
- the following question be referred to the Enlarged Board of Appeal:

"Darf ein Zahlenwert, der eine Testbedingung oder ein Beispiel beschreibt und der ohne Hervorhebung mit anderen ausdrücklich als nicht erfinderisch gekennzeichneten Testbedingungen oder Beispielen aufgezählt ist, als erfindungswesentliches Merkmal in einen unabhängigen Anspruch aufgenommen



werden?"

VIII. The respondent (patent proprietor) requested that the appeal be dismissed and the patent be maintained according to the interlocutory decision of the opposition division. It further requested apportionment of costs incurred to it in respect of the oral proceedings before the opposition division.

Claims 1 and 2 read as follows:

"1. A continuous multi-stand mill plant for producing steel plates wherein the ratio of maximum rolling speed to minimum rolling speed is at least 4.0 but not more than 10.0 at the continuous rated output of one or of a plurality of electric motor(s) (11) for driving at least one of said rolling mill stands, and having means (13, 14) for controlling the speed of said motor(s) (11) in accordance with said ratio, wherein said electric motor(s) (11) are alternating-current motor(s).

2. A continuous multi-stand mill plant for producing steel plates wherein a speed varying transmission is provided between a rolling mill stand and its electric drive motor so as to achieve a ratio of maximum rolling speed to minimum rolling speed of at least 4.0 but not more than 10.0 at the continuous rated output of one or a plurality of electric motor(s) for driving at least one of said rolling mill stands."

IX. The arguments of the appellants can be summarised as follows:

(i) The restriction of the originally claimed range

of 3 to 10 by increasing its lower limit to 4 is not admissible under Article 123(2) EPC given its lack of disclosure in the application as originally filed. Contrary to the findings in the decision under appeal, the speed ratio 4.0 is not disclosed by the curve of Figure 3, since the values 1 to 10 that is also 4.0 are merely intended to represent the scale on the abscissa. Although the speed ratio 4.0 is specifically referred to in the test schedule on page 4 line 2 of the patent (original page 7, line 15), that is clearly not related to operation under a speed cone. According to the test schedule described in the paragraph bridging pages 3 and 4 of the European patent specification materials shown in table I are rolled in a single reversible stand mill exhibiting speed ratios from 2.0 to 10. This single reversible stand mill is not relevant to the present invention which relates to a continuous multi-stand mill plant with speed cone characteristics. This means that the value 4.0 on page 4, line 2 is not part of the invention and thus cannot be introduced into the claims 1 and 2 without violating Article 123(2) EPC.

Furthermore, it is nowhere specified that the speed ratio 4.0 has to be considered as a preferred embodiment as is the reference to the speed ratio 5 on page 4, line 20. It follows that the limitation of the claimed range is based on an arbitrary restriction, which according to the well established case law of the Boards of Appeal is not allowable under Article 123(2) EPC.

- (ii) As stated in the introductory part of the European patent there had been a problem or difficulty in performing rolling and of inefficient use of rolling mill power, since a conventional rolling mill was designed for rolling either thick or thin material.

The object of the present invention is to provide a continuous multi-stand mill plant for rolling steel plates of a wide range of dimensions (thicknesses) and qualities using the whole effective power of the rolling mill stands (see page 2, lines 58 to 61).

In the prior art Document D7 there is also disclosed a continuous multi-stand mill plant for rolling thick and thin materials. Moreover it is already known for example from Document D9 that the schedule of reductions from pass to pass must be such as to allow the mill stand speeds to fall within the "speed cone". Any skilled tandem mill operator, being aware of the operational restrictions imposed by a given speed cone, naturally seeks to reduce such restrictions wherever feasible by extending the speed cone.

In this respect Document D3 teaches the use of variable a-c drives having a specific range of speed ratio of 1:10 whose regulation costs are said to be low. It is also expressis verbis stated that this kind of a-c drives is able to satisfy the high dynamic requirements as main drive for rolling trains ("höchste dynamische Anforderungen für den Hauptantrieb von

Walzstraßen").

In view of this teaching the skilled person conscious of the desirability of widening the speed cone and thus of reducing the operational restrictions imposed by it would be incited to employ a-c drives having a speed ratio of 1:10 for driving the stands of the multi-stand mill plant according to D7 or of the "Wuhan" tandem mill, since these drives would offer according to the author of this article a very promising improvement.

- (iii) Also Document D15 provides a clear indication that large adjustable speed a-c drives can be used in mill drives to overcome "inherent commutation problems" encountered with d-c drives. Rolling mill main drive is mentioned as typical application for such large adjustable speed a-c drives.
  
- (iv) Moreover the "Wuhan" speed cone and the speed cone of the European patent are essentially the same, there being only a minimal difference between the lower limit 4.0 of the claimed range and the value 3.2 of the "Wuhan" tandem mill. Since the effect achieved by the invention should also be minimal for this boundary value (it should normally become more marked as the speed ratio approaches the preferred range from 5 to 10) there is no difference in substance between the speed ratio 3.2 of the "Wuhan" tandem mill and the claimed value 4.0. The broadening of the speed cone of the "Wuhan" tandem mill from 3.2 to 4.0 lies therefore

within the normal design variations available to the skilled person.

- (v) In the proceedings before the opposition division the appellant I had submitted orally and in writing that the subject-matter of claim 1 was not novel over Document D3. The fact that the appealed decision failed to take into account such facts, evidence and arguments in support of lack of novelty, represented a contravention of Rule 68(2) EPC and thus a substantial procedural violation justifying the reimbursement of the appeal fee.

- X. The above submissions were contested in great detail by the respondent. It particularly argued that the widening of the speed cone in order to reduce the required rated output ratio of the motor(s) was the essence of the invention and that the available prior art did not provide any suggestion in this request.

Having regard to its request for apportionment of costs incurred as a result of the oral proceedings before the opposition division it submitted that the appellants I and II had searched relevant prior art documents over many years and continued to introduce new documents and evidence into the proceedings, without satisfying explanation as to why these documents were cited so late in the proceedings. It was only such late filing of evidence which had rendered necessary the further oral proceedings before the opposition division.

## **Reasons for the Decision**

1. The appeals are admissible.
2. *Procedural matters*
- 2.1 As to the request of appellant I for reimbursement of the appeal fee:

Appellant I correctly points out that the decision under appeal completely ignores Document D3 as well as the facts and arguments based on that document which were brought forward in support of lack of novelty.

It is established jurisprudence of the Boards of Appeal (see J 7/82, OJ EPO 1982, 391 and T 94/84, OJ EPO 1986, 337) that the right to be heard in accordance with Article 113(1) EPC also guarantees the right to have the relevant grounds fully taken into account in the written decision, that is the ground(s) for opposition as well as the facts, evidence (inter alia prior art documents) and arguments presented in support of these grounds for opposition. A failure to do so was considered as a substantial violation of the right to be heard (Article 113(1) EPC).

However in the Board's view the circumstances of the present case are very particular, because the decision under appeal thoroughly deals with Document D15 which like Document D3 relates to large adjustable a-c drives and to their possible application for rolling mill main drives. This means that the reasoning relied upon by the opposition division in respect of Document D15 could in essence be applied to Document D3. Expressed differently, Document D3 could not possibly be considered to be more relevant than Document D15 which

was cited by the appellants in support of lack of novelty and of inventive step.

In any case the opposition should have stated in the decision under appeal that in its view the relevance of Document D3 and that of Document D15 were in essence the same. In the Board's judgement this omission on the part of the opposition division does not amount to a substantial procedural violation within the meaning of Rule 67 EPC and had no bearing on the outcome of the decision.

The request for reimbursement of the appeal fee is therefore rejected.

- 2.2 As to the Respondent's request for apportionment of costs under Article 104 EPC:

In the present case, neither a request was made before the opposition division for an apportionment of the costs incurred in connection with the oral proceedings held before this first instance, nor did the opposition division consider and decide upon such matter in the decision under appeal.

Article 21(1) EPC provides that a Board of Appeal can only examine appeals from decisions of the first instance departments of the EPO. This clearly means, in the circumstances of the present case, that the Board cannot examine and decide upon a request for apportionment of costs incurred as a result of oral proceedings before the opposition division, if that request was presented for the first time before the Board of Appeal and thus no decision has been taken on this request by the first instance. Thus the Board is

not competent to consider and decide upon this request (see also the decision J 12/85 "Inadmissible appeal/KUREHA", OJ EPO 1986, 155).

The request of the respondent for apportionment of costs must therefore be rejected.

2.3 As to the referral of the question cited under point VII above to the Enlarged Board of Appeal

Claim 1 as originally filed claims a range of speed ratios from 3 to 10 which is shown in Figure 3 as filed. This Figure comprises a text where this range is designated as "Range defined by the invention". There is thus no doubt that the speed ratio 4.0 which is included in this range is part of the invention ("Erfindungswesentliches Merkmal").

In contrast, the question which the appellant I requested to be referred to the Enlarged Board of Appeal pursuant to Article 112(1)(a) EPC is related to the case where a particular value disclosed in an example or a test is introduced into a claim, although this added value had not been originally disclosed as part of the invention.

Since the situation on which the question is based, i.e. the introduction of a value which is not originally disclosed as part of the invention into an independent claim, does not arise in the present case, the request for referral of the above question to the Enlarged Board of Appeal must therefore also fail.

3. *Article 123(2) EPC*



As has been already explained, claim 1 as originally filed specifies a speed ratio ranging from 3 to 10. The speed ratio 4.0 which falls within the claimed range figures not only on the abscissa of the curve shown in Figure 3 but also as one of the values (2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0 and 10.0) from which the curve has been plotted.

The speed ratio 4.0 is also specifically referred to in the test schedule described in the paragraph bridging, pages 3 and 4 of the patent specification. The appellants' submission that this test does not relate to the invention since it merely concerns a single reversible stand having a speed-varying transmission in which the materials are rolled respectively at the rolling speed ratios of 2.0, 2.5, 3.0, 4.0, 5.0, 7.0, 8.0 and 10.0 and that the results achieved by the use of a single reversible stand which is not related to operation under a speed cone are not transposable to tandem rolling conditions, cannot be followed.

As pointed out by the respondent, economic considerations obviously preclude the possibility of such experiments actually being carried out on a tandem rolling mill including five stands. For this reason, the patentee has simulated the requisite tandem operating conditions of a five stand rolling mill with the aid of a single reversible stand. In this experiment the materials were rolled at rolling speed ratios ranging from 2.0 to 10.0 through five passes. This experimental simulation of the tandem operating conditions, which also implies calculations, is sufficiently described at the paragraph bridging pages 3 and 4 of the patent specification.

Therefore the restriction of the originally claimed range of speed ratios from 3 to 10 by increasing its lower limit to 4 is not arbitrary since it is based on a numerical value, which is explicitly disclosed by Figure 3 as well as in the described experimental simulation of the claimed multi-stand rolling mill. It follows that this amendment is admissible under Article 123(2) EPC.

4. *Novelty*

The Board is satisfied that the subject-matter of claim 1 and that of claim 2 are novel over the opposed prior art documents.

Since this has not any longer been disputed during oral proceedings before the Board there is no need for further detailed substantiation of this matter.

5. *Inventive step*

5.1 As stated in the introductory part of the patent specification there had been a problem or difficulty in performing rolling and of inefficient use of rolling mill power with conventional rolling mills which were designed for rolling either thick material or thin material (cf page 2, lines 40 to 43).

The problem to be solved by the present invention is to provide a continuous multi-stand mill plant for rolling steel plates having a wide range of dimensions (thicknesses) and qualities by using the whole effective power of the rolling mill stands (see page 2, lines 58 to 61).

This problem is solved either by the features stated in claim 1 or by those stated in claim 2.

- 5.2 Both claims require that the ratio of maximum rolling speed to minimum rolling speed at the continuous rated output of the electric motor(s) be at least 4.0 but no more than 10.0 for at least one of the rolling mill stands. The technical effect associated with this requirement is that, as demonstrated by Figure 3, there is a marked reduction in the rated output for drive motors exhibiting speed ratios ranging from 4 to 10 compared with those in the speed ratio range between 2 and 4.

The claimed teaching is based on the idea that by widening the speed ratio at the continuous rated output of at least one mill stand drive and thus of the speed cone of a continuous multi-stand rolling mill, such multi-stand rolling mill can handle a wide range of plate thicknesses with drive motors having a lower continuous rated output, so that the investment price can be lowered.

- 5.3 Prior to the claimed invention it was known, for example from D9, that the schedule of reductions from pass to pass be such as to allow the mill stand speeds to fall within the "speed cone". However there is no disclosure or suggestion in that document and the other opposed prior art, that the possibility of rolling thick and thin material is affected by the restriction of the speed cone and that the widening of the speed cone would bring about a twofold substantial improvement: on the one hand it provides high rolling efficiency for materials of different thicknesses and on the other hand it allows the power of the multi-

stand mill to be used more efficiently by reducing the continuous rated output of the motors required for driving the multi-stand mill.

5.4 The "Wuhan" prior use discloses only one distinct speed ratio, i.e. "3.2", for d-c motors and suggests nothing with respect to the problem underlying the present invention and nothing with respect to the claimed increase of the speed ratio from 4 to 10. It is noted that the increase of the speed ratio from 3.2 as disclosed by the "Wuhan" prior use to the claimed lower limit 4.0 amounts to 25% and thus cannot be considered as a negligible increase of the speed ratio in a continuous multi-stand rolling mill.

5.5 It has also been submitted that D3, in disclosing a-c variable speed motors having low regulation costs and which operate over a speed range of at least 1:10, taken together with the general reference in the same document to their potential use for the main drive of rolling mills, provides all the information necessary to arrive at the subject-matter of claim 1. However, the reference is to rolling mills in general without any specific indication of continuous multi-stand mills for rolling steel plate. Moreover this citation merely provides a general survey of the existing state of the art concerning the use of variable speed a-c motors, which may have an extremely wide range of speed ratio of 1:1000 (page 2) which is far from the range defined in claims 1 or 2, i.e. 4.0 to 10.

Thus this citation does not disclose the essential features of the invention defined in claim 1 that is

(i) a continuous multi-stand rolling mill for

producing steel plates,

- (ii) the specific range of speed ratio from 4 to 10 of an a-c motor at the continuous rated output and
- (iii) the means for controlling the speed of the motor in accordance with the speed ratio.

Consequently, this general information concerning a-c variable speed motors for various industrial uses does not give the skilled person any indication which could lead to installing such a-c motor for driving a mill stand of a multi-stand rolling mill within the claimed speed range from 4 to 10 at the continuous rated output, so as to improve the rolling efficiency and to reduce the continuous rated output of the motors required for driving the multi-stand mill.

- 5.6 Document D15 specifically discloses a-c motors for a reversing blooming mill (page 27, abstract, page 30 right column fifth paragraph). There is no disclosure of a continuous multi-stand mill plant for producing steel plates.

Furthermore the speed ratio of 600 to 6000 mentioned at page 29, right column indicates the available overall design range not the speed ratio at the continuous rated output of a specific motor, since the description states clearly: "Load commutated inverters are used for high-speed drive applications between approximately 600-6000 rpm."

Document D7 which relates to a multi-stand rolling mill permitting thick and thin material to be rolled, evidences a range for the speed cone of less than 1:3.

- 5.7 Therefore the opposed prior art documents as well as the "Wuhan" prior use do not give any indication that thick and thin products may be rolled in a single multi-stand rolling mill comprised of mill stands equipped with drive motors having a lower continuous rated output and thus also effectively lower investment and operation costs, by extending the speed cone according to the present invention.

It has also been submitted that any skilled person, knowing the economical significance of the speed cone would always strive to extend it up to the limits of current technical possibilities. Such submission is not however supported by any substantive evidence. Furthermore, as rightly stated in the decision under appeal, although it may be true in the context of the present claim 1 that the requisite a-c drive motors had been only recently available (Document D15 was only published in November 1984) at the time of the present invention, the same argument does not hold good for the subject-matter of claim 2, also suited to perform the invention, since speed-varying transmission leading to the same effects have been known in the relevant art for a long time.

- 5.8 Summarizing, in the Board's judgement, the subject-matter of claim 1 and that of independent claim 2 also involve an inventive step (Article 56 EPC) so that the patent is to be maintained on the basis of these main claims.

6. Dependent claims 3 and 4 concern particular embodiments of the invention claimed in claims 1 or 2 and are likewise allowable.

The opposition grounds thus do no prejudice the maintenance of the patent as amended.

## **Order**

### **For these reasons it is decided that:**

1. The appeals are dismissed.
2. The request of appellant I for reimbursement of the appeal fee and the request of the respondent for apportionment of costs are rejected.

The Registrar:

The Chairman:

S. Fabiani

F. Gumbel