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D E C I S I O N
of 25 July 2002

Case Number: T 0785/98 - 3.2.1

Application Number: 92303829.3

Publication Number: 0512735

IPC: B21B 1/18

Language of the proceedings: EN

Title of invention:

Method for continuously hot rolling of ferrous long products

Patentee:

MORGAN CONSTRUCTION COMPANY

Opponent:

DANIELI & C. OFFICINE MECCANICHE SpA

Headword:

-

Relevant legal provisions:

EPC Art. 56, 83, 84, 100(b), 102(3), 123(2)

Keyword:

"Sufficiency of disclosure (yes)"

"Inventive step (yes)"

Decisions cited:

T 0301/87

Catchword:

-



Case Number: T 0785/98 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 25 July 2002

Appellant: DANIELI & C.
(Opponent) OFFICINE MECCANICHE SpA
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Representative: Petraz, Gilberto Luigi
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Respondent: MORGAN CONSTRUCTION COMPANY
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Representative: Woodcraft, David Charles
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted 29 June 1998
concerning maintenance of European patent
No. 0 512 735 in amended form.

Composition of the Board:

Chairman: F. Gumbel
Members: M. Ceyte
J. Van Moer

Summary of Facts and Submissions

- I. The respondent is proprietor of European patent No. 0 512 735 (application No. 92 303 829.3).
- II. The patent was opposed by the appellant on the grounds of lack of patentability under Article 100(a) EPC and insufficiency of disclosure under Article 100(b) EPC.

The following state of the art was i.a. cited:

D1: GB-A-2 168 280

D2: US-A-4 907 438

D5: US-A-3 992 915

D6: DE-C-2 437 684.

- III. By its interlocutory decision posted on 29 June 1998 the opposition division maintained the patent in amended form.

Claim 1 reads as follows:

"1. A method of continuously hot rolling ferrous rod or bar products, comprising:

directing the products through a plurality of roll stands including a finishing group (16) followed by a post finishing block (20), said finishing group having a plurality of two-roll round and oval finishing passes (S20-S27) arranged to alternately impart oval and round cross-sectional configurations to the products passing therethrough, wherein at least some of the roll stands in the finishing group can be dummied to vary the

product size being fed to the post finishing block, characterised in that:

the post finishing block has at least four successive two roll post finishing passes (S28-S31), the first of said post finishing roll passes (S28) being an oval roll pass configured to impart an oval cross section to the products passing therethrough, the remainder of said post finishing roll passes being round roll passes configured to impart round cross-sectional configurations to the products passing therethrough,

said post finishing roll passes are sized to effect progressively smaller reductions in product cross-sectional area with the reductions in said round post finishing roll passes totalling at least 14%, of which less than 20% occurs in the last of said round post finishing roll passes,

and with the time interval between rolling in the first and the last of said post finishing roll passes being such that grain size across the cross-section of the products being rolled does not vary by more than 2 ASTM."

- IV. On 6 August 1998 the appellant (opponent) lodged an appeal against this decision, with the appeal fee being paid at the same time.

The statement of grounds of appeal was filed on 23 October 1998.

- V. The appellant (opponent) requested that the decision under appeal be set aside and that the European patent be revoked in its entirety.

In essence the appellant argued that in the patent the

claimed invention was not sufficiently disclosed for it to be performed by a skilled person (Article 100(b) EPC).

It also submitted that the claimed subject-matter is not inventive over the opposed prior art documents. Additionally it argued that amended claim 1 is not supported by the description as required by Article 84 EPC and contains subject-matter which extends beyond the content of the application as filed (Article 123(2) EPC).

VI. The respondent (patent proprietor) rejected in detail the arguments brought forward by the appellant. It requested that the patent be maintained in the amended form approved by the opposition division, subject to the following amendment

- at line 5, page 4 "Preferably, the reduction" should read "The reduction".

Reasons for the Decision

1. The appeal is admissible.
2. *Article 123 EPC*

There is no formal objection under Article 123(2) EPC to the current version of claim 1.

In particular, the added feature "at least **four** successive two roll post finishing passes (S28 - S31)" is supported by the passage at page 3, lines 54 to 55

(of the European patent as published) "the post finishing block includes at least two reduction stands followed by at least two sizing stands". Thus this amendment does not extend beyond the content of the application as originally filed.

Amended claim 1 contains all the features of granted claim 1 so that the requirements of Article 123(3) are also met.

3. *Insufficiency of disclosure; clarity*

3.1 Article 100(b) requires that the patent discloses the invention in a manner that a skilled person is not only able to understand the teaching of the invention but also that he is able to implement it.

The appellant suggests that a skilled person would be unable to implement the claimed teaching, particularly the claimed requirement that the time between rolling the first and the last of the post finishing roll passes must be such that the grain size across the cross-section of the product being rolled does not vary by more than 2 ASTM grain size numbers.

The claimed invention is based on the observation that "abnormal grain growth can occur as a result of the time interval which conventionally occurs between the last significant reduction which takes place during normal rolling and the lighter reductions which take place during sizing" (page 3, lines 11 to 13 of the patent specification).

Reference is also made to the further pertinent passage of the specification (page 3, lines 27 to 30):

"Thus, unless sizing occurs sufficiently soon after the last significant mill reduction, the intervening unabated grain growth coupled with only localized surface grain deformation during sizing will produce an unacceptable dual grain microstructure, with the size of grains varying significantly throughout the cross-section of the product"(emphasis added).

Hence, the skilled person when reading the patent as a whole will definitively understand the teaching of the European patent as meaning that sizing in the post finishing block should occur sufficiently soon after the last higher reduction effected in the oval-round pass sequence so as to avoid an abnormal grain growth. In concrete terms - as defined in claim 1 - the time interval between rolling in the first and the last of said post finishing roll passes should be short enough such that grain size across the cross-section of the products being rolled does not vary by more than 2 ASTM.

The Board cannot accept the opponent's view that the skilled person utilising its common general knowledge would be unable to carry out this teaching in practice, if necessary with a reasonable number of experiments. As rightly stated by the Opposition Division, Tables III and IV of the granted patent give a large number of examples of the amount of reduction at each stand and thus the amount of deformation which the skilled person should employ. It is true that there is no indication whatsoever about the spacing between the stands. However the skilled person following the teaching of the European patent is aware that due to e.g. a larger spacing between the second and third of the post finishing rolls, the time interval would

increase thereby exacerbating the abnormal grain growth problem. Thus he would consider to decrease such spacing in order to achieve the desired result for a given speed of material.

In this respect reference should also be made to the time-ranges indicated on page 9, lines 9 to 12 of the specification, although it is true that this passage is somewhat unclear, since it cannot be seen how the time interval between rolling in the second stand S29 and the third S30 can be 25 milliseconds, when the time interval for rolling through the last three stands S29 to S31 can only be 16 milliseconds at the most.

It should also be remembered that in order to establish insufficiency of disclosure the burden of proof is upon the Opponent. In the present case the Appellant (Opponent) has failed to submit evidence to support its allegation that the claimed teaching could not be performed by a skilled person without undue burden.

- 3.2 The appellant further argues that it would be very expensive to carry out necessary experiments in order to determine the spacing between the roll stands because they would entail i.a. moving the bases of the roll stands which are often massive. In the Board's view such experiments would not place an undue burden on the skilled person since one set of stand spacings could be used for a large number of different combinations of starting and finishing calibres by varying the speed of the rod through the sizing block. Furthermore, as rightly stated by the respondent (patentee) rolling mill stands do not necessarily have a fixed spacing and as illustrated in Figure 5 of the patent in suit and as indicated at lines 1 to 5 on

page 5 of the description, it is possible to vary stand spacings by mounting individual blocks on tracks and moving individual blocks on or off the rolling mill line using hydraulic rams.

3.3 The Board is unable to follow the further argument of the appellant that although the speed of the rod through the sizing block and the stand spacings are essential for the performance of the invention, there is no indication whatsoever in the patent in suit about these parameters. As has been already stated, the patent in suit clearly teaches that the time interval between the rolling in the first and last of the post finishing roll passes should be such that grain size across the cross-section of the products being rolled does not vary by more than 2 ASTM. Taking into account the examples of appropriate time intervals on page 9, lines 8 to 13 it would be readily possible to any technician knowing that the time interval is equal to the stand spacing/speed ratio and starting from a selected time interval and given speed to determine the appropriate stand spacing for achieving the desired result.

3.4 It follows from the above considerations that the claimed invention is disclosed in a manner sufficiently clear and complete for it to be carried out by a skilled person (Article 83 and 100(b) CBE).

3.5 Article 84 EPC requires that the claims must be supported by the description. According to the EPC it is not possible to oppose against a European patent on the ground that any of the claims as granted offends against Article 84 EPC. In particular Article 102(3) EPC provides no basis for a lack of support in the

description under Article 84, unless such objection would arise from the amendments made after grant, but this is here not the case (see also T 301/87, OJ EPO 1990, 335)

4. *Inventive step*

4.1 Both parties agreed that document D2 represents the nearest prior art.

The claimed method differs from that disclosed in D2 (see Figures 7, 8 in combination with the example in column 7, line 63) by virtue of the following features:

- (i) a post finishing block having at least four successive roll passes, the first of which is an oval pass;
- (ii) the time interval between rolling in the first and last roll passes is selected so that grain size across the cross-section of the product being rolled does not vary by more than 2 ASTM.

Starting from this nearest prior art the problem to be solved by the claimed teaching is in essence that stated on page 3, lines 49, 50 that is to provide a method of sizing steel rod to produce a wide range of precisely dimensioned product sizes, while avoiding abnormal grain growth leading to a duplex microstructure in the finished product.

4.2 There is no disclosure or suggestion in the prior art cited by the appellant (opponent) of selecting a sufficiently short time interval between rolling in the first and last roll passes in the post finishing stage

so as to avoid abnormal grain growth.

Although document D2 is equally concerned with improving the precision of rolled products it is not concerned with obtaining a uniform micro-structure in the rod.

The remaining prior art cited by the appellant played no significant role during the proceedings before the Board. None of these citations would lead the skilled person to modify the disclosure of D2 by supplying in particular the above essential feature (ii):

D1 is not concerned with the problem of overcoming abnormal grain growth. Furthermore this citation teaches that a round final product could be obtained by using three roll working sizing passes having straight contour lines followed by at least two dimensioning sizing passes with substantially circular contour. In contrast to the invention it suggests that it was inadvisable to use an oval pass as a working sizing pass (cf. page 2, lines 88 to 90).

Document D5 contains no mention of abnormal grain growth and it is not concerned with post-finishing or sizing blocks.

Document D6 describes locating a cooling means between the finishing mill and in a post finishing mill in order to carry out thermo-mechanical rolling. However this citation is not concerned with a post-finishing mill capable of sizing the product and contains no teaching as to how to achieve uniform grain structure in a post-finishing sizing mill.

4.3 Therefore, in the Board's judgment, the subject-matter of amended claim 1 cannot be derived in an obvious manner from the available prior art and consequently involves an inventive step (Article 56 EPC). Accordingly the patent is to be maintained on the basis of this main claim.

5. Dependent claims 2 to 6 relate to particular embodiments of the invention claimed in claim 1 and are likewise allowable.

The opposition grounds thus do not prejudice the maintenance of the patent in amended form.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to maintain the patent in the amended form approved by the opposition division, subject to the amendment at page 4 according to the respondent's request (see point VI above).

The Registrar:

The Chairman:

S. Fabiani

F. Gumbel