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Datasheet for the decision of 16 April 2010

Case Number: T 1997/07 - 3.2.06

Application Number: 02292316.3

Publication Number: 1295651

IPC: B21C 37/08

Language of the proceedings: EN

Title of invention:
Method of producing steel pipes

Patentee:
SUMITOMO METAL INDUSTRIES, LTD.

Opponent:
Europipe GmbH

Headword:
-

Relevant legal provisions:
-

Relevant legal provisions (EPC 1973):
EPC Art. 54, 56

Keyword:
"Claim 1, novelty and inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1997/07 - 3.2.06

D E C I S I O N
of the Technical Board of Appeal 3.2.06
of 16 April 2010

Appellant: (Opponent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 21. November 2007 rejecting the opposition filed against European patent No. 1295651 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: P. Alting Van Geusau
Members: M. Harrison
W. Sekretaruk

Summary of Facts and Submissions

I. The appellant (opponent) filed an appeal against the decision of the opposition division rejecting the opposition against European patent No. 1 295 651.

II. The appellant requested revocation of the patent and in support of its arguments relied on the following documents:

E1: DE 195 22 790 C
E2: WO 00/68443 A

III. The respondent (proprietor) requested dismissal of the appeal.

IV. Following the issue of a summons to oral proceedings to take place on 16 April 2010, the Board issued a communication stating its provisional opinion, indicating that the subject matter of claim 1 appeared to be novel with regard to E1 and E2. In regard to the X70 material disclosed in E1, the Board noted that this did not appear to have the microstructure or yield strength claimed, while the X80 material disclosed in E2 seemed to disclose the yield strength but not necessarily the microstructure. Further features of claim 1 were also considered not to be known from E1 and E2. The Board also stated that, when taking E1 as the closest prior art, it remained to be discussed whether the subject matter of claim 1 involved an inventive step.

V. With its facsimile letter of 16 April 2010 which arrived early on the day of the oral proceedings, the

appellant stated that it was unable to attend oral proceedings due to closure of the airspace over Berlin. Additional arguments were given in writing, whereby reference was made to:

E4: US 5 794 840

which was mentioned in the granted patent.

The request for revocation of the patent was maintained.

No request for adjournment was made. Also, in accordance with the appellant's telephone request, the Rapporteur returned the telephone call of the appellant on the morning of the proceedings indicating that its facsimile had been received and that the minutes of the oral proceedings would be sent in due course.

VI. In the absence of the appellant, as notified, oral proceedings were held before Board.

The respondent was provided with a copy of the appellant's facsimile letter of 16 April 2010.

VII. During the oral proceedings, the respondent confirmed its request for dismissal of the appeal.

VIII. Claim 1, the sole independent claim of the granted patent, reads as follows:

"A method of producing a steel pipe having a microstructure of martensite and/or bainite which amounts to at least 80% as expressed in terms of area

percentage, and having a yield strength of not lower than 551 MPa, said method comprising the steps of forming and welding a steel plate into a steel pipe and expanding the steel pipe, characterized in that said expanding step comprises expanding the steel pipe by 0.3 to 1.2 % and in that said method further comprises the step of reducing the expanded steel pipe by 0.1 to 1.0%."

IX. The arguments of the appellant may be summarised as follows:

For considering novelty and inventive step, the microstructure and yield strength defined in claim 1 had to be ignored since no method steps were included in the claim for arriving at such characteristics. This also meant the claim lacked clarity because no features of claim 1 taught a skilled person how a steel pipe with the claimed yield strength and microstructure could be obtained, in particular since no specific steel composition was defined and the composition was what led to the defined microstructure. E1 and E2 were both prejudicial to the novelty of claim 1. Claim 3 of E1 disclosed expansion of the pipe by up to 2% followed by reduction of up to 4%, whereby the ranges in claim 1, which fell in the middle part of the ranges in E1, were thus disclosed. E2 included the same relevant content of E1 on page 6, and claims 7 and 8 thereof disclosed a degree of expansion followed by reduction by an amount which should be selected in accordance with the required characteristics. Whilst E1 disclosed expansion and reduction of an X70 steel pipe, this was only one example of a pipe on which the method of E1 could be used, so it was not limited to this. E4 was

very similar to E1, but was not restricted to the specific types of pipe disclosed in claims 2 and 3 thereof.

In respect of inventive step, and using E1 or E4 as a starting point, the use of expansion by "up to" 2% followed by reduction of "up to" 4% would teach a skilled person, who was attempting to provide the most favourable characteristics in a pipe, to start by using small amounts of expansion first, such as 0.5% or 1%, then to use small amounts of reduction, rather than to proceed immediately to maximum quoted values of expansion and reduction in E1 and E4. In E2 claim 8, it was also disclosed that the order of expansion and reduction could by reversed and the amounts varied, according to the profile required. A skilled person would thus arrive at the subject matter of claim 1 without using inventive skill merely by proceeding like this when trying to solve the problem of obtaining the required characteristic profile.

X. The arguments of the respondent may be summarised as follows:

Claim 1 was novel over E1, E2 and E4 since e.g. the claimed steel microstructure was not disclosed in any of these. The yield strength in claim 1 was disclosed in E2 due to use of the X80 pipes; this was not the case for E1 or E4. E2 did not disclose the microstructure of claim 1. All the elements of the claimed combination had to be taken into account; a particular type of steel pipe was being produced by the claimed process, with high strength characteristics. The ranges of expansion and reduction quoted in E1 to

E4 were very broad, whilst the ranges defined in claim 1 were narrow and had a specific purpose.

As regards inventive step, E1 and E4 did not deal with a high strength pipe. Merely because an example was quoted using X70 steel did not mean that the process of E1 would be understood by a skilled person as being applicable to a stronger pipe with the special microstructure as defined in claim 1. Moreover, E2 gave no guidance regarding how, if at all, to vary the expansion or reduction percentages, let alone teach the selection of not only an expansion value lying within the expansion range in the claim but also, in combination therewith, a reduction value for a pipe which also lay within the reduction range claimed. Starting at paragraph [0049] of the patent, it was explained how the ranges solved the problem of providing a pipe with the required characteristics. The results in Table 2 showed that the desired effects were produced with the ranges claimed.

Reasons for the Decision

1. *Introduction of E4 into proceedings*

1.1 Although E4 had not been mentioned by the appellant until its fax of 19 April 2010, its content was essentially the same as E1. One difference highlighted by the appellant was that the particular use of the pipes, namely as onshore pipes or offshore pipes in claims 2 and 3 of E1, was not a limitation in E4.

Further, E4 was mentioned in paragraph [0008] of the patent, including a description of the relevant content thereof.

1.2 The respondent had no objection to the introduction of E4. The Board thus exercised its discretion under Article 13(1) of the Rules of Procedure of the Boards of Appeal (RPBA) to allow the appellant to change its case in this regard, since the relevant content of E4 was not limited to the particular types of pipe disclosed in E1. E4 was thus admitted into proceedings.

2. *Novelty*

2.1 The appellant argued that the subject matter of claim 1 lacked novelty over E1 and E2, partly on the basis that certain features of claim 1, namely features (1) and (2) below, should be ignored:

(1) producing a steel pipe having a microstructure comprised of martensite and/or bainite which amounts to at least 80% as expressed in terms of area percentage,

and

(2) and having a yield strength not lower than 551 MPa.

The Board however finds that these features cannot be ignored when considering novelty (or inventive step), since the method of claim 1, whilst not defining the particular steps for achieving features (1) and (2), or the metal composition, is nevertheless limited to pipes which must have these characteristics. Features (1) and (2) are also understood by a skilled person to be

properties of high strength pipes which are thus important when considering their methods of production and not something which can be ignored in this regard.

2.2 E1 does not disclose features (1) and (2) above. E1 relates to the production of pipes according to the UOE method (see e.g. column 1, lines 3 to 5). The only example given of a pipe used for the starting material in E1 is API X70 (see e.g. column 2, lines 46-49 "X70-TM"). Although the Board had already mentioned this in its provisional opinion, no evidence was provided by the appellant which would show that this steel material had the properties defined by features (1) and (2) above.

2.3 In regard to E2, this discloses e.g. X80 material (see e.g. page 3, lines 27 to 32) which a skilled person implicitly understands as having the yield strength defined in feature (2) above. This was not disputed by the respondent. However, nothing in E2 indicates that the process thereof results in pipes having a microstructure according to feature (1), as was also communicated with the Board's provisional opinion. The appellant provided no evidence to alter this opinion.

2.4 The subject matter of claim 1 is thus novel over E1 and E2, even if only for the foregoing reasons alone. However, the following features of claim 1, labelled features (3) and (4), are also not known from E1 or E2:

(3) expanding the steel pipe by 0.3 to 1.2%
and
(4) reducing the expanded pipe by 0.1 to 1.0%.

2.5 Features (3) and (4) above define limits for expansion and reduction and the reduction step must be performed after the expansion step, since reduction is performed on the expanded pipe. The two ranges are thus not separate from one another but must be viewed in combination.

2.6 E1 discloses in claim 2 a reduction followed by an expansion and in claim 3 an expansion followed by a reduction. Claim 3 is therefore the only one of these claims that corresponds to the order of steps defined in claim 1. Whilst claim 3 discloses ranges of expansion of up to 2% ("Aufweiten ... um bis zu 2%") and reduction by up to 4% ("Reduktion ... um bis zu 4%"), nothing in E1 discloses any values inbetween. Figure 6, which is the only drawing showing the expansion/reduction sequence of claim 1, discloses a 2% initial expansion followed by a 4% reduction.

Since the ranges of features (3) and (4) define a combination of expansion and reduction, which involves a selection of a combination of narrow ranges of expansion and reduction from the combined broad ranges in E1, and which ranges are purposively selected (see e.g. paragraphs [0049] and [0050]), features (3) and (4) are novel with regard to E1.

2.7 E2 discloses in claims 7 and 8 that expansion and reduction can be used to pre-process pipes produced by the UOE process, whereby the amount of expansion and reduction respectively depends on the characteristic profile to be obtained. No values of expansion or reduction are given explicitly, but general reference is made on page 6, third paragraph, to DE 195 22 790 A1,

(the published application resulting in E1) and the conditioning treatment mentioned therein.

For the same reasons as apply to E1, E2 therefore also does not disclose features (3) and (4) of claim 1.

2.8 Although no specific argument with respect to lack of novelty was made with regard to E4, it may be added that nothing in the disclosure of E4 compared to that in E1 can be found by the Board which would alter the aforegoing conclusions.

2.9 Claim 1 is thus novel having regard to the prior art cited in the appeal proceedings and therefore fulfils the requirements of Article 54 EPC 1973.

2.10 The appellant also argued that claim 1 was not clear since it gave no teaching as to how features (1) and (2) could be obtained, in particular because there were no method steps defined for obtaining these, and the metal composition was not defined.

2.10.1 The objection to a lack of clarity of claim 1 is an objection under Article 84 EPC 1973, and therefore does not concern a ground of opposition. Similarly the objection that claim 1 does not teach how to obtain features (1) and (2) is also an objection to lack of clarity under Article 84 EPC 1973 since it is directed to the claim as such. It may also be added that no evidence was filed to show that a skilled person could not produce a pipe with the claimed features.

2.10.2 Although no metal composition is defined in the claim, this does not alter the fact that the composition must

be such that the defined microstructure can be obtained. Since the microstructure is not independent of the composition, implicit limitations on the metal composition used in the process are therefore present.

3. *Inventive step*

3.1 Both parties agreed that E1 or E4 could be taken as the closest prior art starting point for considering inventive step, and the Board agrees in particular because each of these defines an order of expansion and reduction together with ranges of both, whereas E2 leaves these entirely undefined. The subject matter of claim 1 differs with respect to each of E1 and E4 by the features (1), (2), (3) and (4) as noted above.

3.2 The problem to be solved appears to be to provide a method of production of steel pipes with desirable characteristics or a "required profile" (see e.g. E4, column 1, line 54), including in particular mechanical properties. This technical problem can also be found implicitly in the disclosure in paragraphs [0049] and [0050] of the patent.

3.3 The microstructure and yield strength (features (1) and (2)) relate to high strength pipes, whereby an X80 grade has a tensile strength of at least 551 MPa (whereby increasing X grade results in higher tensile strength). In E1 and E4 however, the steel disclosed for the expansion and reduction method used therein is X70 (see e.g. E1 column 2, lines 46 to 49; E4 column 2, lines 63 to 66), i.e. a steel of lower yield strength.

3.4 Already at the outset the skilled person is presented in E1 and E4 with a method which is not necessarily applicable to steel pipes which have a higher yield strength (as claimed), let alone with the specific microstructure claimed - at least no evidence has been supplied by the appellant from which the Board can draw a different conclusion.

3.5 When considering the expansion and reduction ranges disclosed in E1 and E4, it is noted that although the skilled person is aware that a value other than 2% expansion and other than 4% reduction might be used, due to the terminology "up to 2%" and "up to 4%", there is no teaching in either document as to why a skilled person would select a smaller amount of expansion or reduction to obtain any particular characteristic, let alone select any particular part of both ranges in E1 and E4 for any reason. The only specific example of expansion followed by reduction given in E1 and E4, as already noted above, is a 2% expansion and a 4% reduction. In E1 it is noted that this is for offshore pipes (see claim 3). In E4, the specific application to a certain type of pipe is not stated, but this does not assist the skilled person any further towards selecting the ranges defined in claim 1; it merely leaves unknown what use a pipe would have with the disclosed example of 2% expansion and subsequent 4% reduction.

3.6 Thus neither E1 nor E4 provide the skilled person with a teaching as to the specific ranges in claim 1 allowing a pipe with desirable characteristics to be obtained.

3.7 Although an X70 steel pipe is only given as an example in E1 and E4, this does not provide the skilled person with information as to how the process might be adapted in any way when producing pipes of a higher yield strength or different microstructure.

3.8 E2 also does not assist the skilled person any further, since whilst E2 does give an example of X80 pipes (and even higher API X grades) which do have the yield strength defined in claim 1, the amounts of expansion and reduction by which the pipe should be conditioned to take account of this are not stated. At best, the reference to DE 195 22 790 A1 on page 6 of E2 together with the disclosure in claims 7 and 8 of E2 that the order and the amount of expansion and reduction should be varied in accordance with the characteristic profile, can only be understood to mean that the ranges of expansion followed by reduction may be used to provide pipes especially useful for offshore use. These pipes however would have a 2% expansion followed by a 4% reduction. Merely stating that the amount and order of expansion and reduction can be varied according to the required profile does not, alone, teach a skilled person to vary either the amount of expansion or reduction, let alone both, to provide any desirable characteristics, let alone with a microstructure as defined in claim 1.

3.9 The appellant also argued that a skilled person wishing to find a desirable amount of expansion and reduction would start generally in the middle of the ranges disclosed in E1 and E4 because the wording "up to 2%" and "up to 4%" is used. However, this supposition is not supported by any evidence. The skilled person is

taught by E1 that a pipe for the specific purpose of being an offshore pipe can be obtained in an expansion followed by reduction method, with specific values of each. No differing values of expansion, let alone reduction, have been disclosed as being suitable in E1, E2 or E4 for any particular purpose. In the patent in paragraphs [0049] and [0050] a specific purpose is however given to the ranges selected in claim 1 and the appellant has provided no evidence to suggest that the support for the selected ranges would be incorrect or that such purposive selection of the expansion and reduction ranges is not valid over the whole of the combined ranges claimed.

3.10 Although the appellant argued that claim 1 was not directed to a specific metal composition in that its elemental structure is left undefined in claim 1, no evidence was provided by the appellant to show that when using any specific metal composition, the subject matter of claim 1 would then be obvious, in particular when considering that the metal composition is not entirely open but must be such that features (1) and (2) are present in the steel pipe produced by the method.

3.11 Therefore, on the basis of the prior art cited and the arguments submitted by the appellant, the Board concludes that the subject matter of claim 1 involves an inventive step and that the requirements of Article 56 EPC 1973 are fulfilled.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar The Chairman

M. Patin P. Alting van Geusau