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Datasheet for the decision of 20 November 2015

Case Number: T 1828/11 - 3.2.05

Application Number: 03788949.0

Publication Number: 1554518

IPC: F16L58/18

Language of the proceedings: EN

Title of invention:
Threaded pipe with surface treatment

Patent Proprietor:
Tenaris Connections Ltd.

Opponent:
Vallourec Oil and Gas France

Headword:
-

Relevant legal provisions:
EPC Art. 112(1)(a)
EPC 1973 Art. 54, 56, 83

Keyword:
Admissibility of a fresh ground for opposition – no
Referral to the Enlarged Board of Appeal - admissibility (no)
Novelty – yes (main request)
Inventive step – no (main request and first auxiliary request)
Sufficiency of disclosure – yes (second auxiliary request)
Inventive step – yes (second auxiliary request)

Decisions cited:
G 0010/91

Catchword:
-

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Case Number: T 1828/11 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 20 November 2015

Appellant II: (Patent proprietor)	Tenaris Connections Ltd. 112 Bonadie Street Kingstown (VC)
Representative:	Bruno Cinquantini Notarbartolo & Gervasi S.p.A. Corso di Porta Vittoria, 9 20122 Milano (IT)
Appellant I: (Opponent)	Vallourec Oil and Gas France 54, rue Anatole France 59620 Aulnoye-Aymeries (FR)
Representative:	Gabriel de Kernier Cabinet Netter Conseils en Propriété Industrielle 36, avenue Hoche 75008 Paris (FR)
Decision under appeal:	**Interlocutory decision of the opposition division of the European Patent Office posted on 8 July 2011 concerning maintenance of the European Patent No. 1554518 in amended form.**

Composition of the Board:

Chairman	M. Poock
Members:	H. Schram
	G. Weiss

Summary of Facts and Submissions

I. Appellant I (opponent) and appellant II (patent proprietor) each lodged an appeal on 16 August 2011 and 16 September 2011, respectively, against the interlocutory decision of the opposition division posted 8 July 2011 concerning the maintenance of European patent No. 1 554 518 in amended form. The respective statements setting out the grounds of appeal were filed on 14 and 17 November 2011.

The opposition division held that the subject-matter of claim 9 as granted and claim 9 of the first auxiliary request filed during the oral proceedings were not new, but that the grounds of opposition under Article 100(a) EPC 1973 (lack of novelty, Article 54 EPC 1973, and lack of inventive step, Article 56 EPC 1973), and Article 100(b) EPC 1973 (insufficiency of disclosure, Article 83 EPC 1973) did not prejudice the maintenance of the patent on the basis of the set of claims filed by appellant II during the oral proceedings as second auxiliary request.

II. Oral proceedings were held before the board of appeal on 20 November 2015.

III. Appellant I requested that the decision under appeal be set aside and that the European patent be revoked in its entirety, that the appeal fee be reimbursed for substantial procedural violations by the opposition division, and on a subsidiary basis, that the case be remitted to the opposition division if a new opposition ground is admitted into the proceedings and that the following question submitted at the oral proceedings is referred to the Enlarged Board of Appeal:

"*La décision G 10/91 trouve-t-elle à s'appliquer dans le cas où l'introduction du nouveau motif découle d'une interprétation d'un terme par la Division d'Opposition dans sa décision sans que cette interprétation ait été énoncée au cours de la procédure orale?*".

Appellant II requested that the decision under appeal be set aside and that the patent be maintained as granted (main request) or in amended form on the basis of any of the sets of claims filed with the statement of grounds of appeal dated 16 November 2011 as first and second auxiliary requests, or any of the sets of claims filed on 28 May 2012 as 3rd to 6th auxiliary requests.

IV. Claims 1 and 9 of the main request (patent as granted) read as follows:

"1. A pipe segment (1) of definite length for oil extraction industry made of a metal, having a central, portion with a substantially cylindrical wall and at least a threaded end portion (3, 4) covered with a surface protection characterised in that at least the metal surface in the threaded end portion (3, 4) has a surface roughness (Ra) comprised between 2,0 µm and 6,0 µm, said surface protection being constituted by a first uniform layer (7) of a dry corrosion inhibiting coating made of an epoxy resin containing particles of Zn and a second uniform layer (8) of dry lubricant coating covering said first layer (7)."

"9. A pipe segment (1, 2) of definite length for the oil or gas extraction industry made of a metal, with a central portion with a substantially cylindrical wall and at least a threaded end portion (3,4) covered with

a surface protection, characterised in that at least the metal surface of the threaded end portion (3,4) has a surface roughness (Ra) comprised between 2,0 µm and 6,0 µm, and said surface protection is constituted by one uniform layer (9) made of a dry corrosion inhibiting coating containing a dispersion of particles of solid lubricant".

Claim 9 of the first auxiliary request differs from claim 9 of the main request in that the expression "including particles of molybdenum disulphide" has been added at the end of the claim.

Claims 1 to 8 of the second auxiliary request are identical to claims 1 to 8 as granted. Claims 9, 10, 11 and 12 of the second auxiliary request correspond to claims 10, 11, 13 and 14, respectively.

V. The following documents were inter alia referred to in the appeal proceedings:

D1 EP-B 0 786 616;

D2 EP-B 1 365 183;

D3 EP-B 0 939 111;

D5 US 4,473,481;

D9 *Exploring surface texture*, Dagnall H, published by Rank Taylor Hobson, Leicester, England, March 1980, front page, pages (ii), (iii), 4, 5, 46, 47 and 170;

D10 EP-A 1 211 451.

VI. The arguments of appellant I, in writing and during the oral proceedings, can be summarized as follows:

Admissibility of a fresh ground for opposition and a request for referral of questions to the Enlarged Board of Appeal

In the decision under appeal the opposition division held that the term "uniform" in claim 1 as granted had a broad meaning and could refer to thickness, surface aspect, or other properties such as the absence of holes, see point 2.2 of the Reasons, last paragraph. This interpretation, which was not supported by the patent in suit, created legal uncertainty. Claim 1 as filed required that the surface of the threaded end portion of the pipe segment was covered by a first uniform layer and that said first layer was covered by a second uniform layer. In contrast, claim 1 as granted merely required that the threaded end portion of the pipe segment was covered with a surface protection, which was constituted by a first uniform layer and a second uniform layer.

Due to the broad interpretation of the claim, claim 1 as granted no longer required that the first uniform layer completely covered the threaded end portion, or that the second uniform layer covered the first uniform layer, and therefore encompassed the possibility that first uniform layer 7 only partly covered the pipe segment (as long as the second uniform layer 8 covered the areas of the pipe segment that were not covered by the first uniform layer 7, the pipe segment was covered by the "surface protection 7, 8").

Claim 1 as granted thus contained subject-matter that extended beyond the application as filed, cf Article

100(c) EPC in combination with Article 123(2) EPC. Since this new ground for opposition resulted from the broad interpretation of the claim by the opposition division, its introducing into the appeal proceedings was consistent with Opinion G 10/91. On a subsidiary basis it was requested to remit the case to the opposition division, or to refer a question to the Enlarged Board of Appeal.

Novelty - claim 9 of the main request

The "surface roughness (Ra)" mentioned in claims 1 and 9 of the main request was neither defined in the patent, nor could it be inferred from the patent that Ra stood for average or mean surface roughness. On the contrary, Figures 3 and 4 showed that Ra corresponded to the peak-to-valley distance, ie Rmax. If the surface roughness in claim 9 of the main request was taken to stand for Rmax, then documents D1 and D10 disclosed all the features of said claim.

If however the surface roughness was taken to stand for the average surface roughness, the subject-matter of claim 9 of the main request still lacked novelty with respect to said documents for the following reasons. It was known from document D9 that the value of the surface roughness Rmax was bigger than the average surface roughness by a factor between 3.14 and 5.7, see Figure 38. Since in document D1 the surface roughness Rmax was between 3 µm and 30 µm and in document D10 between 3 µm and 15 µm, the corresponding average surface roughness necessarily fell in the range claimed in claim 9 of the main request.

Inventive step - claim 9 of the main request and claim 9 of the first auxiliary request

The only difference between the subject-matter of claim 9 of the main request and the pipe segment known from document D10 was the range of the surface roughness Ra. That was also the only difference with respect to document D5. Choosing the surface roughness Ra in the claimed range was obvious to the skilled person, since using each one of the conversion factors Rmax/Ra known from D9 would convert the Rmax range for the surface roughness range known from document D10 into a corresponding Ra-range which fell within the claimed range. The subject-matter of claim 9 of the main request was therefore obvious to the skilled person. Since the additional features of claim 9 of the first auxiliary was already known from the same document, the subject-matter of said claim was also obvious.

Sufficiency of disclosure - claim 1 of the second auxiliary request

The patent in suit did not contain any information about the adhesion between the first and second uniform layers 7, 8. The invention was therefore not disclosed in the patent in suit in a manner sufficiently clear und complete for it to be carried out by a person skilled in the art.

Inventive step - claim 1 of the second auxiliary request

The only substantial difference between granted claims 1 and 9 was that in the former claim the surface protection consisted of two layers, ie a dry corrosion inhibiting coating and a dry lubricant coating, whereas in the latter the surface protection was constituted by one single bi-functional layer, ie a layer having both

corrosion inhibiting and lubricating properties. In the patent in suit these claims were described as alternative solutions. There were no advantages of one solution over the other. Therefore, for the same reasons given for claim 9 of the first auxiliary request, the subject-matter of claim 1 of the second auxiliary request was also obvious.

Starting from the first embodiment of document D10, which concerned a pipe segment having a single bi-functional surface protection layer, ie a lubricating film containing a rust preventing additive, it was obvious to the skilled person to provide a separate rust preventing film in addition to a lubrication film without a rust preventing additive, since such rust preventing films were taught by document D10, see eg page 5, lines 40 to 43. In this passage is was proposed to form a rust preventing film on the lubrication film. However, it was within the normal design practice of the skilled person to investigate a different order of the films, for example to apply the rust preventing film on the metal surface of the thread (which was more logical) and to form the lubrication film atop the rust preventing film.

A pipe segment having a surface protection consisting of two layers, viz a lower porous zinc or zinc alloy layer and an upper solid lubricating coating, was known from document D2. The subject-matter of claim 1 of the second auxiliary request differed from the pipe segment known from said document only in that the lower layer was a dry corrosion inhibiting coating made of an epoxy resin containing particles of Zn rather than a porous zinc or zinc alloy layer. An epoxy resin undercoating containing particles of Zn was known from document D3. Applying such an epoxy resin was easier than applying a

porous zinc or zinc alloy layer by impact plating as taught in document D2, especially for the female part of a threaded joint. The skilled person starting from document D2 and seeking an easier and cheaper manufacturing process of depositing the first layer would apply the epoxy resin coating of document D3 as an undercoating and hence arrive at the invention.

It followed that starting from document D10 or D2, that the subject-matter of claim 1 of the second auxiliary request did not involve an inventive step.

Request for reimbursement of the appeal fee for substantial procedural violations by the opposition division

The opposition division committed several substantial procedural violations. In particular, in the decision under appeal (see point 2.2 of the Reasons, page 6, third paragraph from the bottom) it was stated with respect to the first objection raised by appellant I ("the roughness of the metal cannot be determined in the final product"): "The roughness of the metal surface is easily determinable on the final product for a skilled person, there is no reason that the coating would destroy or change it, and the coating is "washable" and therefore removable to access to metal surface roughness measurement". The argument that the coating was "washable" had never been discussed during the opposition proceedings and constituted a violation of the right to be heard, cf Article 113(1) EPC.

In the last two paragraphs of page 6 of the decision under appeal (see point 2.2 of the Reasons) it was stated with respect to the second and third objections raised by appellant I ("examples of an organic binder,

cf claim 3, and of a solid lubricant were not given in the patent"), that there was enough indication in the cited prior art in the relevant field of threaded pipe for oil extraction to enable the skilled person in the art to select, without undue effort, an inorganic binder and suitable solid lubricant particles to be mixed with the MoS_2 and compatible with the application. The opposition division referred to the "cited prior art" in general terms, but failed to give precise locations where the information could be found. Moreover, the opposition division should have referred to common technical general knowledge, and not to specialised patent literature.

Two important arguments submitted by appellant I, namely that claim 1 of the main request did not exclude that layers 7 and 8 were identical (cf point 5.1.1 of the minutes), so that the layers constituted a single bi-functional layer as in claim 9 of the main request, and that the distinguishing feature of claim 1 of the then second auxiliary request over document D10, ie providing a first uniform layer containing particles of Zn, did not have any technical effect, since the anticorrosion was inherent to zinc, were not discussed in the decision under appeal. Consequently, the decision was not reasoned, cf Rule 111(2) EPC.

The request for reimbursement of the appeal fee was therefore justified.

VII. The arguments of appellant II, in writing and during the oral proceedings, can be summarized as follows:

Admissibility of a fresh ground for opposition

The attempt of appellant I to introduce a new ground of opposition was not related to any amendment made during the opposition proceedings, but to amendments made during the examination proceedings. It would be against the practice and jurisprudence of the EPO to introduce said new ground into the appeal proceedings.

Novelty – claim 9 of the main request

The surface roughness Ra designated the average surface roughness and was well-known in the art, see document D9. In documents D1 and D10 the ranges for the surface roughness were expressed as the maximum surface roughness (Rmax). Document D9 disclosed four specific ratios Rmax/Ra. It could not be deduced from these documents that any of the ratios known from document D9 could be applied to calculate the ranges for the surface roughness in documents D1 and D10 in terms of the average surface roughness. The subject-matter of claim 9 of the main request was therefore new.

Inventive step – claim 9 of the main request and claim 9 of the first auxiliary request

An important feature of the invention was that the surface of threaded end portion was treated to obtain a surface roughness in the range of 2 µm to 6 µm. This range of the surface finish was essential for the adhesion of the subsequent coatings, cf paragraph [0021] of the patent. The Rmax/Ra – ratios known from document D9 could not be applied to the Rmax range known from document D10. The subject-matter of claim 9 of the main request and of the first auxiliary request therefore involved an inventive step.

Sufficiency of disclosure - claim 1 of the second auxiliary request

The embodiment according to claim 1 of the second auxiliary request was shown in Figure 3, showing a first layer 7 of corrosion inhibiting coating deposited on the threading metal surface, and a second layer 8 applied on the first layer 7 once said first was fully dried, both layers applied by spraying, brushing, dipping or any other method in which the coating thickness was controlled, cf paragraph [0027] of the patent. The patent gave hence sufficient information to the skilled person how to apply the two layers.

Inventive step - claim 1 of the second auxiliary request

The rust preventing film of document D10 was an oil composition, not a dry corrosion inhibiting coating made of an epoxy resin containing particles of Zn as in claim 1 of the second auxiliary request. Moreover, the rust preventing film of document D10 was formed atop the lubricating film, ie it was the second layer whereas in claim 1 of the second auxiliary request the dry corrosion inhibiting coating was the first layer. The order of the layers was important for achieving the object of the invention, ie increasing the corrosion and galling resistance properties in repeated make-up and break-out operations.

In document D2 the blasted zinc or zinc alloy layer was an additional layer. In contrast to the invention, this layer was not applied for providing a surface roughness to the mating surface, since that was achieved by grinding or sand blasting, see Table 2 (“Pretreatment”). The skilled person would not omit the

blasted zinc or zinc alloy layer. Document D3 did not relate to pipe lines for the oil and gas extraction industry and did not disclose a lubricating layer. The skilled person would not have combined document D2 and D3. The subject-matter of claim 1 of the second auxiliary request therefore involved an inventive step.

Reasons for the Decision

1. The appeal is admissible.

2. *Admissibility of the fresh ground for opposition raised by appellant I*

2.1 Appellant I raised a new ground for opposition in its statement of grounds, namely that claim 1 as granted contained subject-matter that extended beyond the application as filed, cf Article 100(c) EPC 1973 in combination with Article 123(2) EPC.

According to the opinion G 10/91 (OJ EPO 1993, 420, point 3 of the Opinion) "[Fresh] grounds for opposition may be considered in appeal proceedings only with the approval of the patentee".

At the beginning of the oral proceedings before the board the representative of appellant II was asked whether he gave its consent for introducing said fresh ground for opposition into the appeal proceedings, and the representative answered that he did not.

Consequently, the fresh ground for opposition cannot be admitted into the appeal proceedings.

2.2 Appellant I requested that the case be remitted to the opposition division if a new opposition ground was admitted into the proceedings.

Since the fresh ground for opposition is not admitted into the appeal proceedings (cf point 2.1 above), the precondition for the request is not met.

3. *Request for referral of questions to the Enlarged Board of Appeal*

After the chairman announced at the end of the oral proceedings that claim 1 of the second auxiliary request met the requirements of sufficiency of disclosure, cf Articles 100(b) and 83 EPC 1973, appellant I requested that a question be referred to the Enlarged Board of Appeal.

The question reads (see point III above) "*La décision G 10/91 trouve-t-elle à s'appliquer dans le cas où l'introduction du nouveau motif découle d'une interprétation d'un terme par la Division d'Opposition dans sa décision sans que cette interprétation ait été énoncée au cours de la procédure orale?*" ("*Does decision G 10/91 apply in the case where the introduction of the new ground for opposition arises from an interpretation of a term by the opposition division in its decision, which interpretation was not announced during the oral proceedings?*" - translation by the board).

A prerequisite for referring questions to the Enlarged Board is that a decision is required for the decision to be taken, cf Article 112(1)(a) EPC.

Since the board did not admit the fresh ground for opposition into the appeal proceedings at the point in time that the question was not yet filed by appellant I, a decision by the Enlarged Board on the question of appellant I is not required for the final decision of the present board.

It follows that the request for referral of questions to the Enlarged Board of Appeal must be refused.

MAIN REQUEST

4. *Ground for opposition under Article 100(a) EPC 1973 in combination with Article 54 EPC 1973*

4.1 Interpretation of claims 1 and 9 of the main request

The board has no doubt that the person skilled in the art will interpret the notion "surface roughness (Ra)" in the expression "that at least the metal surface of the threaded end portion (3,4) has a surface roughness (Ra) comprised between 2,0 µm and 6,0 µm" (cf the first characterising feature of claim 1 and 9) as the arithmetic average of the surface roughness (rather than for example Rmax, which is the measure of maximum roughness, defined as the distance, in height, measured from the top of the highest peak to the bottom of the lowest valley of a surface texture), since the expression Ra is well-known in the art and stands for arithmetic roughness, cf document D9, pages 46 and 47, in particular the formula at the top of Figure 38). Since drawings in patent specification are schematic, it cannot be inferred from Figures 3 and 4 of the patent in suit, or from the value of Ra relative to the thicknesses of the layers 7 to 9, that the expression Ra should be construed to stand for Rmax.

In paragraph [0022] of the patent in suit it is stated that "the desired metal surface roughness can be achieved by several methods, such as abrasive blasting, phosphate coating or other equivalent mechanical or chemical processes". Said paragraph does not exclude a process wherein abrasive blasting followed by a phosphate coating are combined. The person skilled in the art will construe the wording "metal surface" in the first characterising feature of claim 1 and 9 of the main request, in the light of said paragraph and claim 15 of the main request, as the surface of the metal pipe segment, or, if the surface roughness of the metal is achieved by depositing a phosphate layer on the metal surface, as the surface of said phosphate layer.

4.2 Document D10 discloses (see claim 1 and Figure 4) a pipe segment with all the features of the preamble of claim 9 of the main request. This document further discloses that a solid lubricating such as molybdenum disulfide is formed on the surface, see page 4, lines 5 to 12. In the section describing the first embodiment (see page 9, lines 14 to 58) it is mentioned that a rust preventing additive or a corrosion inhibitor may be added to the lubricating film in order to prevent the formation of rust, see page 9, lines 42 and 43. This document therefore discloses the last characterising feature of said claim, viz "said surface protection is constituted by one uniform layer (9) made of a dry corrosion inhibiting coating containing a dispersion of particles of solid lubricant".

Document D10 discloses that the surface roughness Rmax of the portion on which the lubricating film is formed (the substrate) is preferably at least 3 µm and at most

15 µm (page 9, lines 33, 34, and 53 to 58). Since this document is silent about the actual profile of the surface roughness, it cannot be deduced with certainty from the range for Rmax what the corresponding range would be, when expressed as the arithmetic average Ra.

It follows that document D10 does not disclose the first characterising feature of claim 9 of the main request.

4.3 Also document D1 discloses a pipe segment with all the features of the preamble of claim 9 of the main request. In particular, this document discloses (see page 3, lines 50 to 57, paragraphs [0050] to [0053] and Figures 10 and 11) a threaded joint of an oil well steel pipe, whereby a phosphate chemical formation coating layer 5 is provided on the metal surface of a threaded end portion. The surface roughness of the coated threaded end portion has a surface roughness RM (Rmax) comprised between 3 µm and 30 µm, see paragraph [0053]. A resin coating layer 6, in which powder of molybdenum disulfide is dispersed, is formed on the phosphate chemical formation coating layer 5. The resin coating layer 6 is a solid lubricant (see page 4, lines 23 and 24) and, since a corrosion inhibitor may be dispersed and mixed in the resin (see page 4, line 17), said resin coating layer 6 is a “dry corrosion inhibiting coating containing a dispersion of particles of solid lubricant” as claimed in claim 9 of the main request.

For the same reason as given in point 4.2 above, document D1 does not disclose the first characterising feature of claim 9 of the main request.

4.4 The subject-matter of claim 9 of the main request is therefore new with respect to documents D10 and D1.

5. *Ground for opposition under Article 100(a) EPC 1973 in combination with Article 56 EPC 1973*

5.1 The subject-matter of claim 9 of the main request differs from the pipe segment known from document D10 or D1 in "that at least the metal surface of the threaded end portion (3, 4) has a surface roughness (Ra) comprised between 2,0 µm and 6,0 µm".

5.2 The patent specification is silent about the reasons why the surface roughness Ra of the metal surface of the threaded end portion should be between 2 µm and 6 µm, and silent about the advantages of choosing a surface roughness Ra in said range.

The person skilled in the art knows that a suitable surface roughness should be imparted on the metal surface of the threaded end portion in order to provide a so-called anchor effect between said metal surface and a coating provided thereon, cf document D10, page 9, lines 33 to 36. A "suitable" surface roughness is a surface roughness that is not too small (if the metal surface is too smooth, the anchor effect may be too small for holding the coating) and not too large with a view to prevent galling (cf document D2, page 11, lines 25 to 27) and to allow a second layer to be formed on the first coating.

The board is of the opinion that in view of these requirements selecting an appropriate surface roughness comes within the normal design practice of the person skilled in the art of threaded joints for oil well pipe.

5.3 The person skilled in the art knows that Rmax is larger than Ra by a factor of at least 2, but, as noted in point 4.2, he or she does not known with certainty how large that factor is, when the actual profile of surface texture having a surface roughness is Rmax not known. Document D9 gives a "conversion factor" (Rmax/ Ra) of 3,14 and 4 for a sinusoidal and sawtooth profile, respectively, and factors 4,7 and 5,7 for more spiky surface textures.

The person skilled in the art, starting from the pipe segment known from document D10 (Rmax between 3 µm and 15 µm) or D1 (Rmax between 3 µm and 30 µm) and seeking to provide the metal surface of the threaded end portion with a surface roughness expressed in Ra rather than in Rmax, will apply a realistic estimate for the conversion factor, for example a value of about 3 (rather than in a range of 5,7 or higher), which would result for document D10 in a range 1 µm to 5 µm, and for document D1 in a range 1 µm to 10 µm. The ranges thus obtained overlap to a large extent with the range claimed in claim 9 of the main request.

5.4 In the judgment of the board it was therefore obvious to the person skilled in the art, starting from the pipe segment known from document D10 or D1, and using his or her general technical knowledge and/or the surface roughness (Rmax) ranges given in said documents, to provide the metal surface of the threaded end portion with a surface roughness (Ra) in the claimed range.

Consequently, the subject-matter of claim 9 of the main request does not involve an inventive step, Article 56 EPC 1973.

FIRST AUXILIARY REQUEST

6. *Ground for opposition under Article 100(a) EPC 1973 in combination with Article 56 EPC 1973*

6.1 Claim 9 of the first auxiliary request differs from claim 9 of the main request in that the expression "including particles of molybdenum disulphide" has been added at the end of the claim.

6.2 The additional feature is known from both document D10 and D1, see points 4.2 and 4.3 above. For substantially the same reasons as given in point 5 above why the subject-matter of claim 9 of the main request does not involve an inventive step starting from the pipe segment known from document D10 or D1, the subject-matter of claim 9 of the first auxiliary request does also not involve an inventive step.

SECOND AUXILIARY REQUEST

7. *Ground for opposition under Article 100(b) EPC 1973 in combination with Article 83 EPC 1973*

7.1 In its statement of grounds (see point VI above) appellant I has made several objections of insufficiency of disclosure against the claims of the patent in suit with respect to the terms surface roughness Ra, inorganic binder, solid lubricant and uniform layer. The board assumes that these objections apply to the claims of the second auxiliary request as well.

In a communication of the board dated 10 September 2015 the provisional opinion was expressed that the claimed

invention is disclosed in the patent in suit in a manner sufficiently clear und complete for it to be carried out by a person skilled in the art, Articles 100(b) and 83 EPC 1973, cf point 7 (pages 10 to 14). The board adopt this provisional opinion as its own considerations.

7.2 During the oral proceedings appellant I no longer addressed its objections made in its statement of grounds and/or in its letter dated 14 October 2015, but raised a new objection of insufficiency of disclosure, namely that the patent in suit did not contain any information about the adhesion between the first and second uniform layers.

Appellant I did not submit any evidence that the adhesion between the claimed first and second uniform layers is insufficient to meet the object of the invention, namely increasing the corrosion and galling resistance properties in repeated make-up and break-out operations of the threaded end portion of a pipe segment, and increasing the corrosion resistance of a pipe segment during transport and storage (see paragraphs [0001], [0004] and [0020] of the patent).

That the patent is silent about the adhesion between the first and second uniform layers does not necessarily imply that the claimed invention cannot be carried out by a person skilled in the art. Claim 1 of the second auxiliary request does not require a particular adhesion or bonding between layer 7 and layer 8, it merely specifies that a threaded end portion of the pipe segment is covered with a "surface protection being constituted by a first uniform layer (7) of a dry corrosion inhibiting coating ... and a second uniform layer (8) of dry lubricant coating

covering said first layer (7)". Paragraph [0027] provides information about how the dry corrosion inhibiting coating 7 and the dry lubricant coating 8 can be successively applied onto the threaded metal surface, and about the thickness of said layers. This information is sufficient for the person skilled in the art to carry out the claimed invention.

7.3 The invention claimed in claim 1 of the second auxiliary request is therefore disclosed in the patent in suit in a manner sufficiently clear und complete for it to be carried out by a person skilled in the art, Articles 100(b) and 83 EPC 1973

8. *Ground for opposition under Article 100(a) EPC 1973 in combination with Article 56 EPC 1973*

8.1 Interpretation of claim 1 of the second auxiliary request

Claim 1 of the second auxiliary request specifies that a threaded end portion of the pipe segment is covered with a surface protection being constituted by:

- a first uniform layer (7) of a dry corrosion inhibiting coating made of an epoxy resin containing particles of Zn and

- a second uniform layer (8) of dry lubricant coating covering said first layer (7).

In the opinion of the board, the person skilled in the art, having regard to the patent specification read as a whole, would construe said claim in a straightforward manner as meaning that a threaded end portion is first

coated with the dry corrosion inhibiting coating 7 and then with the dry lubricant coating 8.

Appellant I has submitted that claim 1 as granted did not exclude that the first uniform layer 7 of a dry corrosion inhibiting coating had also lubricant properties and that the second uniform layer 8 of dry lubricant coating had also dry corrosion inhibiting properties, and that the first and second uniform layers could in fact be identical forming one uniform layer having corrosion inhibiting and lubricant properties such as the pipe segment claimed in claim 9 as granted.

This cannot be accepted. Claims 1 and claim 9 of the patent as granted concern two different embodiments of the invention, and solve the problem of the prior art mentioned in paragraphs [0002] to [0011] in different ways. The solutions are different, and the technical effects may be similar, but are also different. In follows that claim 1 of the second auxiliary request requires two different coatings.

8.2 Whereas in the first embodiment of document D10 a rust preventing additive or a corrosion inhibitor may be added to the lubricating film (see point 4.2 above), document D10 foresees an alternative for imparting rust-preventing properties to the threaded joint, namely by forming an rust preventing film onto the lubricating film (see eg page 5, lines 40 to 44, page 6, line 54 to page 7, line 3, page 13, lines 54 to 56, page 14, lines 9 to 12, Figure 10 and Table 18). It may be noticed that the order of dry lubricant coating and the dry corrosion inhibiting coating in the invention is the other way around.

There is no hint or suggestion in document D10 that the order of the lubricating film, which is formed on the metal surface of the threaded end portion, and the rust preventing film, which is formed atop the lubricating film, can be interchanged.

Hence it was not obvious to the person skilled in the art, starting from the pipe segment known from document D10, to arrive at the subject-matter of claim 1 of the second auxiliary request.

8.3 Document D2

8.3.1 Document D2 discloses (see eg paragraph [0007] and claim 1) a threaded joint for steel pipes comprising a pin and a box capable of mating with each other, each having a threaded and an unthreaded metal contact portion as a mating surface, wherein at least one mating surface is first coated with a lower porous zinc or zinc alloy layer and then coated with lubricating coating, which may be a solid lubricating coating. The metal surface has a surface roughness Rmax in the range of 3 µm to 30 µm, see page 6, lines 26 and 27. The porosity of the porous zinc or zinc alloy layer is the result of forming the layer by impact plating, eg blast plating, and improves the adhesion of the solid lubricating coating, see paragraphs [0017] to [0020] and [0030] to [0034].

The provision of providing a lower porous zinc or zinc alloy layer is a central teaching of document D2.

8.3.2 Document D3 discloses an iron base coating which comprises a zinc dust-contained epoxy resin coating for undercoating an iron base after degreasing and blasting it.

8.3.3 The argument of appellant I that the person skilled in the art starting from document D2 would consider to replace the lower porous zinc or zinc alloy layer taught by said document by the zinc dust-contained epoxy resin coating known from document D3 is in the judgment of the board based on hindsight with knowledge of the invention, since that would go against the central teaching of document D2, cf point 8.3.1 above, last paragraph.

8.3.4 It follows that a person skilled in the art starting from document D2 and taking the teaching of document D3 into account would not arrive at the invention claimed in claim 1 of the second auxiliary request.

8.4 The subject-matter of claim 1 of the second auxiliary request is therefore not obvious to the person skilled in the art and therefore involves an inventive step, Article 56 EPC 1973.

9. It follows from the above that the patent can be maintained on the basis of the set of claims of the second auxiliary request, which corresponds to the set of claims on the basis of which the opposition division intended to maintain the patent.

Consequently, the appeals of appellants I and II cannot be allowed.

10. *Request of appellant I for reimbursement of the appeal fee*

A prerequisite for reimbursement is that the appeal is allowed.

Since the appeal of appellant I is not allowed, the request for reimbursement of the appeal fee cannot be allowed.

There is hence no need to decide on the question whether during the opposition proceedings one or more substantial procedural violation(s) occurred.

Order

For these reasons it is decided that:

The appeals of Appellants I and II are dismissed.

The Registrar: The Chairman:

D. Meyfarth M. Poock

Decision electronically authenticated