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Datasheet for the decision of 10 June 2021

Case Number: T 1845/17 - 3.2.03

Application Number: 07869257.1

Publication Number: 2092157

IPC: E21B23/03, F16K3/02

Language of the proceedings: EN

Title of invention:
LOW FRICTION COATINGS FOR DYNAMICALLY ENGAGING LOAD BEARING SURFACES

Patent Proprietor:
Vetco Gray Inc.

Opponent:
Aker Solutions AS

Headword:

Relevant legal provisions:
EPC Art. 123(2), 56, 100(a), 100(c)
RPBA Art. 12(4)

This datasheet is not part of the Decision
It can be changed at any time and without notice

Keyword:

Amendments - added subject-matter (no)
Inventive step - non-obvious modification
Late-filed evidence - submitted with the statement of grounds of appeal - admitted (no)

Decisions cited:

Catchword:

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Case Number: T 1845/17 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 10 June 2021

Appellant: (Patent Proprietor)	Vetco Gray Inc. 3010 Briarpark Drive Suite 300 Houston TX 77042 (US)
Representative:	Zimmermann & Partner Patentanwälte mbB Josephspitalstr. 15 80331 München (DE)
Appellant: (Opponent)	Aker Solutions AS Postboks 94 1325 Lysaker (NO)
Representative:	Zacco Norway AS P.O. Box 2003 Vika 0125 Oslo (NO)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 2 June 2017 concerning maintenance of the European Patent No. 2092157 in amended form.**

Composition of the Board:

Chairman	C. Herberhold
Members:	B. Miller
	E. Kossonakou

Summary of Facts and Submissions

I. European patent No. 2 092 157 B1 (the "patent") relates to an apparatus for controlling well fluids comprising a low-friction coating and to a method of forming a coating on a metal load-bearing surface.

II. An opposition was filed against the patent, based on the grounds of Article 100(b) and (c) EPC and of Article 100(a) EPC together with both Articles 54 and 56 EPC.

In the interlocutory decision the opposition division found that the contested patent met the requirements of the EPC on the basis of the claims of auxiliary request 1 submitted during opposition proceedings with a letter dated 13 July 2015.

The interlocutory decision was appealed by both parties. As the proprietor and the opponent are both appellants and respondents in the appeal proceedings, for the sake of simplicity the Board will continue to refer to the parties as the proprietor and the opponent in the present decision.

III. The proprietor requested that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the main request as set out in its letter dated 23 March 2018 (claims as granted, but with a correction in claim 2) or, alternatively, on the basis of one of auxiliary requests 1 to 8 as filed with the statement setting out the grounds of appeal (with the same correction in claim 2 as for the main request - see the requests for

amendment on page 18, point 6, of the letter dated 23 March 2018).

The opponent requested that the decision under appeal be set aside and that the patent be revoked.

IV. The independent claims of the main request (including feature numbers proposed by the opponent) read as follows:

Claim 1

i) "An apparatus for controlling well fluids, comprising:
ii) a gate valve (11) having a body (13), the body having a cavity and a flow passage (15) intersecting the cavity;
iii) a seat ring (21) mounted to the body at the intersection of the flow passage and the cavity,
iv) the seat ring having an engaging face formed of a steel alloy;
v) a gate in the cavity and having an engaging face (25) formed of a steel alloy that slidingly engages the face of the seat ring while being moved between open and closed positions;
vi) and a hardened outer layer formed on at least one of the engaging faces of the gate and seat ring;
characterized by:
vii) a friction-resistant coating on the hardened outer layer,
viii) the friction-resistant material being made from molybdenum disulfide, tungsten disulfide or a carbon or diamond-like material
ix) with a thickness in a range of between 2 µm and 8 µm."

Claim 5 is directed to

I) "A method of forming a coating on a metal load bearing surface, comprising:
II) (a) providing a gate valve assembly (11) having a valve body (13) with a cavity and a flow passage (15) intersecting the cavity,
III) a seat ring (21) mounted to the body at the intersection of the flow passage and the cavity,
IV) the seat ring having an engaging face (25) formed of a steel alloy, and
V) a gate (17) in the cavity and having an engaging face formed of a steel alloy that slidingly engages the face of the seat ring while being moved between open and closed positions; and
VI) (b) hardening at least one of the engaging faces; characterized by:
VII) (c) applying a coating selected from a group consisting of molybdenum disulfide and tungsten disulfide to the hardened engaging face
VIII) until the coating has a thickness in a range between 2 µm and 8 µm."

Claims 2 to 4 and 6 to 9 of the main request relate to preferred embodiments of the apparatus according to claim 1 and the method according to claim 5.

V. State of the art

(a) The following documents, cited already during the opposition proceedings, are of particular importance for the present decision:

D1: Olle Wänstrand, "Wear Resistant Low Friction Coatings for Machine Elements"; Comprehensive Summaries of Uppsala Dissertations from the

Faculty of Science and Technology 583, University of Uppsala, 2000, pages 1 to 32;

D3: WO 2006/026564 A2;

D4: Dietmar Franz Scherer, "Herstellung und Charakterisierung von trockenschmierfähigen und verschleißfesten Kombinationsschichten auf Leichtmetallen"; Dissertation, 2002, University of Stuttgart, (Extended Abstract), pages I-XV;

D5: Murakawa et al., "Diamondlike Carbon-Coated Dies for Deep Drawing of Aluminium Sheets"; Transactions of the ASME Vol. 121, November 1999, pages 674 to 678;

D16: US 2004/118455 A1;

D18: EP 1 657 323 A1;

D27: Gadow et al., "Composite coatings with dry lubrication ability on light metal substrates"; Surface and Coating Technology 151-152 (2002), pages 471 to 477;

D30: Matthews et al., "Engineering applications for diamond-like carbon"; Diamond and Related Materials, 3 (1994), pages 902 to 911;

D33: Kazuhisa Miyoshi, "Solid lubrication fundamentals and applications", 2001, pages 260 and 261;

D34: J.R. Davis, "Process Selection Guide"; Surface Hardening of Steels, Chapter 1,2002, pages 1 to 16.

(b) The following new documents were cited by the opponent in its statement of grounds of appeal:

D36: "MoS_2 Dry Film Lubricant", https://www.ws2coating.com/mos2-dry-film-lubricant/;

D37: "Investigation of Molybdenum Disulfide and Tungsten Disulfide as Additives to Coatings for Foul Release Systems", Technical Memorandum No. MERL-2011-37, September 2011;

D38: "Solid/Dry Lubricant Tungsten Disulfide (WS_2) Powder", WS2 Brochure/Data sheet, http://www.lowerfriction.com/product-page.php?categorylD=1;

D39: "Graphite", https://en.wikipedia.org/wiki/Graphite;

D40: "What is Tungsten Carbide or Hard Metal?", https://www.azom.com/article.aspx?ArticlelD=4827;

D41: "Titanium Nitride", https://en.wikipedia.org/wiki/Titanium nitride;

D42: "Titanium", https://en.wikipedia.org/wiki/Titanium;

D43: "Zirconium - Mechanical Properties And Material Applications", https://www.azom.com/article.aspx?ArticlelD=7645;

D44: "Chromium", https://en.wikipedia.org/wiki/Chromium;

D45: "Molybdenum - Mechanical Properties And Material Applications", https://www.azom.com/article.aspx?ArticlelD=7637;

D46: "DLC Coatings - Diamond-Like Carbon", http://www.richterprecision.com/dlc-coatings.html.

(c) The following further document was cited for the first time by the opponent in its letter dated 27 February 2018 (reply to the proprietor's statement of grounds of appeal):

D47: Screenshot from the website of Precision Surface Technology Pte Ltd.: "Diamond-Like Coatings",

7 May 2005,
https://www.web.archive.org/web/20050507173053/
http://www.pst.com.sg:80/diamond.htm.

VI. In a communication pursuant to Articles 15(1) and 17(2) of the Rules of Procedure of the Boards of Appeal (RPBA 2020), which was annexed to the summons to oral proceedings, the Board indicated its preliminary opinion to the parties.

VII. In a letter dated 10 May 2021, the opponent informed the Board that it would not be attending the scheduled oral proceedings and withdrew its request for them.

Consequently, the oral proceedings were cancelled and the appeal proceedings were continued in writing.

VIII. The proprietor's arguments with regard to the main request can be summarised as follows:

(a) Admissibility of documents D33 to D47

The opposition division had made correct use of its discretion by not admitting the late-filed documents D33 and D34.

Documents D36 to D47 had been filed in response to a set of claims - auxiliary request 1 as maintained by the opposition division - which had been submitted as early as 13 July 2015. They could and should therefore have been filed in the opposition proceedings.

Documents D33, D34 and D36 to D47 should thus be disregarded in the appeal proceedings.

(b) Article 100(c) EPC

The amendments in the main request corresponded to the technical teaching of the application as originally filed, in particular that in paragraph [0010].

(c) Article 56 EPC

The invention lay in the field of geotechnical engineering. Only document D3 clearly belonged to this field and disclosed gate valves for controlling well fluids such as oil and gas. However, this document did not disclose the friction-resistant material being made from molybdenum disulfide, tungsten disulfide or a carbon or diamond-like material with a thickness in a range between 2 µm and 8 µm, which resulted in a reduced coefficient of friction and an enhanced durability of the coating. The objective technical problem was thus to provide an apparatus having an increased load-bearing capacity and improved ductility under the harsh environmental conditions arising when controlling well fluids, in particular exposure to elevated temperatures and high pressure. None of the other cited documents D1, D4, D5, D16, D18, D30 or D33 belonged to this specific technical field. Although D16 mentioned water that contained abrasive particles such as sand, a grain of sand in tap water at normal temperatures and pressures represented a completely different technical challenge for a valve from the challenge of controlling well fluids. Hence, none of these documents addressed the objective technical problem defined above and none of them would be consulted by the skilled person when starting from D3.

The objective technical problem formulated by the opponent, i.e. to provide an alternative coating,

contained pointers to the solution and thus derived from an ex post facto analysis.

Therefore, the subject-matter of claims 1 and 5 was not obvious when starting from D3 as the closest prior art.

IX. The opponent's arguments can be summarised as follows:

(a) Admissibility of documents D33 to D47

Documents D33 to D46 further supported the opponent's argumentation and provided an indication of the common general knowledge of the skilled person in relation to the properties of the various materials disclosed in the patent. Specifically, they provided an indication of the skilled person's common general knowledge of the hardness of those materials, which was a relevant property with respect to auxiliary request 1 as maintained by the opposition division.

D47 was filed in response to the proprietor's grounds of appeal and further demonstrated how widespread the use of DLC as friction-resistant coating had been prior to the relevant date of the opposed patent.

The documents should therefore be considered in the appeal proceedings.

(b) Article 123(2) EPC

Although paragraph [0010] of the application as filed disclosed a friction-resistant coating of the materials specified above with the preferred thickness of between 2 µm and 8 µm, it did not disclose this in combination with the thickness of the hardened outer layer. Paragraph [0054] too disclosed only the thickness of

the intermediate coating 47 and thus could not provide a basis for the claimed subject-matter. The application as filed did not, therefore, disclose the combination of features as defined by claim 2 due to the amendments to claim 1.

(c) Article 56 EPC

Starting from D3, the problem presented in the patent was clearly solved by the coating disclosed in D3. Thus, the objective technical problem had to be formulated as finding an alternative low-friction or friction-resistant coating.

Starting from D3, any document dealing with valves would be taken into account by the skilled person faced with solving this problem, since claim 1 of the patent merely defined a gate valve for controlling well fluids of any kind. The location of the gate valve was not specified, nor were the pressures or temperatures of the well fluids. Hence, any known coating would be considered suitable for a well as defined in claim 1.

D18 made reference to the food industry and incinerators, by way of example, as machines in which oil-based hydraulic systems are disadvantageous due to contamination and the risk of flashback. These hydraulic systems were typically subject to high pressure (see paragraph [0005] of D18). The specific reference to incinerators provided an indication that the elements may also be subjected to high temperatures. Hence, D18 belonged in general to the same technical field as D3 and would be considered by the skilled person in order to solve the problem in question.

Furthermore, D16 disclosed valves which also had to deal with possibly abrasive fluids, such as a mixture of water and sand - see page 1, right-hand column, lines 2-5. D16 would also have been consulted by the skilled person confronted with the above problem.

Similarly, any of documents D1, D4, D5, D27, D30, D33 or D47 - which all disclosed alternative low-friction coatings - would have motivated the skilled person to modify the gate valve of D3 and thereby arrive at the subject-matter of claim 1 of the main request in an obvious manner.

The same reasoning applied *a fortiori* to claim 5 of the main request, which did not even mention the type of fluids to be controlled by the valve.

Hence, the subject-matter of claims 1 and 5 was obvious when starting from D3 and considering the teaching relating to the low-friction coatings in any of documents D1, D4, D5, D16, D18, D27, D30, D33 or D47.

Reasons for the Decision

1. Applicable Rules of Procedure of the Boards of Appeal

Both appeals were filed before the revised version of the Rules of Procedure of the Boards of Appeal (RPBA 2020) entered into force on 1 January 2020.

In accordance with the transitional provisions laid down in Article 25 RPBA 2020, the RPBA 2020 are applicable to appeals already pending on the date of

their entry into force as well as to appeals filed after that date (Article 25(1) RPBA 2020).

Article 25(2) RPBA 2020,however, provides that Article 12(4) and (6) RPBA 2020 will not apply to statements of grounds of appeal filed before the RPBA 2020 entered into force or to replies to them filed in due time. Instead, Article 12(4) RPBA 2007 remains applicable, meaning that the admission, or not, of documents D33, D34 and D36 to D47 is still governed by this provision.

2. Admission of documents D33, D34 and D36 to D47

2.1 Documents D33 and D34

Documents D33 and D34 were late-filed in the opposition proceedings and were not admitted into the proceedings by the opposition division, since it did not consider them to be *prima facie* relevant and they were not used during the oral proceedings before the opposition division - see page 8 of the contested decision.

Pursuant to Article 12(4) RPBA 2007, the admission into appeal proceedings of a document which had not been admitted into the proceedings at first instance is at the Board's discretion.

When considering the admittance of such documents, it is established case law that the Board firstly examines whether the opposition division exercised its discretionary power according to the correct criteria and in a reasonable way, if this aspect is contested. Secondly, the Board itself has to consider it appropriate to admit the documents, for instance due to a different evaluation of their relevance.

In the present case the opposition division based its discretionary decision not to admit documents D33 and D34 into the proceedings on the principles established by the case law and did not act in an unreasonable way. This aspect was not challenged by the opponent either. Under these circumstances, the Board sees no reason to overrule the decision in view of the way in which the department of first instance exercised its discretion under Article 114(2) EPC.

Moreover, the Board itself sees no reason to consider D33 or D34 in the appeal proceedings. Therefore, the Board does not admit D33 or D34 into the appeal proceedings.

2.2 Documents D36 to D47

2.2.1 Documents D36 to D47 were filed by the opponent for the first time in the appeal proceedings.

According to Article 12(4) RPBA 2007 the Board has discretion to disregard evidence which could have been presented in the first-instance proceedings.

2.2.2 The opponent did not explain why it failed to submit D36 to D47 during the opposition proceedings, although the opposition division had already indicated in its communication accompanying the summons to oral proceedings that it was not convinced by the opponent's vague arguments concerning novelty and inventive step.

2.2.3 Furthermore, documents D36 to D47 *prima facie* do not appear to be more relevant than the other documents on file. Nor do they appear to constitute a reaction to events during the opposition proceedings.

Documents D36 to D46 describe mechanical properties, in particular the hardness of certain materials mentioned in the patent. The documents were cited by the opponent in the context of objections to the subject-matter of auxiliary request 1. They were not addressed at all in the context of the subject-matter of claim 1 of the main request.

With regard to D47, the opponent stated, on page 12 of its letter of reply to the proprietor's statement of grounds of appeal, that it provides the same information as the various documents on file disclosing DLC coatings and simply demonstrates how widespread DLC coatings were at the priority date of the patent.

Hence, none of the documents D36 to D47 is more relevant to the subject-matter of claim 1 of the main request than the other documents on file.

2.2.4 In summary, D36 to D47 should have been submitted during the opposition proceedings and they are not *prima facie* relevant - at least not to the main request. Therefore, the Board disregarded D36 to D47 for the present decision based on the main request by exercising its discretion pursuant to Article 12(4) RPBA 2007 not to admit them.

3. Article 100(c) EPC - main request

Claim 2 of the main request corresponds to claim 2 as originally filed (reference is made to the A-publication WO 2008/076855 A1, the "application"), except that the SI conversion of 2 mils has been corrected from 50 µm to 50.8 µm.

Claim 2 is dependent on claim 1, which was amended by defining the thickness and the material of the friction-resistant coating.

Claim 1 is based on claim 1 as filed in combination with the general disclosure in paragraph [0010] of the application, where it is explicitly stated:

"The friction-resistant coating can have a thickness in a range of between about 2 and about 8 microns.".

This teaching is - as indicated in point 6 of the preliminary opinion - further confirmed and supported by paragraph [0050] of the application.

The addition of the value for the thickness in SI units in claim 2 does not change its technical teaching.

Hence, the combination of features according to claim 2 of the main request is based on the teaching of claims 1 and 2 as filed, in combination with paragraph [0010] of the application.

The Board thus confirms the reasoning in the last paragraph on page 6 of the contested decision and concludes that the claims of the main request fulfil the requirement of Article 123(2) EPC.

The ground of opposition pursuant to Article 100(c) EPC does not prejudice the maintenance of the patent as amended according to the main request.

4. Article 100(a) EPC in combination with Article 56 EPC - main request

4.1 The patent is directed to a gate valve for controlling well fluids.

4.2 According to page 1, lines 6 to 9, D3 also refers to a gate valve for a well head assembly and thus relates to an apparatus having the same purpose as that disclosed in the patent. Therefore, the Board has no reason to deviate from the finding on pages 8 to 11 of the contested decision that D3 represents a suitable starting point for the assessment of inventive step.

4.3 D3 discloses in claims 12 and 16 an apparatus for controlling well fluids, comprising:

> a gate valve having a body, the body having a cavity and a flow passage intersecting the cavity;
>
> a seat ring mounted to the body at the intersection of the flow passage and the cavity, the seat ring having an engaging face formed of a steel alloy;
>
> a gate in the cavity and having an engaging face formed of a steel alloy that slidingly engages the face of the seat ring while being moved between open and closed positions;
>
> and a thermoplastic coating on a hardened layer of at least one of the faces.

According to page 5, lines 14 to 15, of D3, the thermoplastic coating is a low-friction coating.

4.4 The subject-matter of claim 1 undisputedly differs from the disclosure of D3 in that the apparatus comprises a gate valve with a coating of

a friction-resistant material being made from molybdenum disulfide, tungsten disulfide or a carbon or diamond-like material with a thickness in a range of between 2 µm and 8 µm.

Accordingly, the subject-matter of claim 5 undisputedly differs from the disclosure of D3 in that a hardened engaging face of the gate valve is coated with a friction-resistant material being made from molybdenum disulfide, tungsten disulfide or a carbon or diamond-like material until it has a thickness in a range of between 2 µm and 8 µm.

4.5 The patent refers, in paragraph [0003], to D3 and describes the gate valve disclosed there. Paragraph [0004] of the patent discloses that a thermoplastic low-friction coating suffers from insufficient load-bearing capacity and ductility at elevated temperatures and tends to creep and flow under high contact stress. This might reduce the durability of the coating.

Exactly the same general problem is referred to on page 2, lines 4 to 12, of D3. According to page 2, lines 14 to 18, and claim 1, this problem is solved in D3 by the use of stiffening particulates in the coating.

Hence, D3 addresses the same problem as the patent, but solves it in a different manner.

In view of this finding, the opponent formulated the objective technical problem forming the basis of claim 1 as to find an alternative friction-resistant coating. However, this formulation of the objective technical problem points to the solution, which is to use an alternative coating achieving the same longer

durability at elevated temperatures as the coating used according to D3.

According to established case law, the incorporation of the solution into the formulation of the objective technical problem is to be avoided (Case Law of the Boards of Appeal, 9th edition, 2019, Chapter I.D. 4.3.1).

Taking into account the technical effect of the distinguishing feature as described in the patent, the objective technical problem instead has to be formulated, in more general terms and without any pointer to the solution, as providing an alternative apparatus having long durability at elevated temperatures.

Accordingly, the objective technical problem to be solved by claim 5 can be regarded as providing an alternative method of forming a coating on a hardened engaging face of the gate valve having long durability at elevated temperatures.

4.6 This objective technical problem is solved in a non-obvious manner by an apparatus according to claim 1 and by the method of claim 5.

4.6.1 The opponent correctly points out that claim 1 defines a gate valve for controlling well fluids in general terms, but does not define the location of the gate valve or the pressures or temperatures of the well fluids to be controlled by the valve. It further correctly observes that claim 5 does not require the coating to be applied to a hardened engaging face of a well head assembly.

4.6.2 However, the obviousness of a possible modification of the teaching of a prior-art document has to be evaluated in its technical context. Document D3 states, on page 2, lines 4 to 12, similarly to the disclosure in paragraph [0004] of the patent, that the gate valve must have sufficient load-bearing capacity and ductility at elevated temperatures to withstand the high contact stress. Hence, starting from D3, the skilled person would only consider a modification of the gate valve of D3 or the method of applying a coating to one of its surfaces if the requirements of the gate valve according to D3 were still regarded as likely to be achievable.

The requirement of the apparatus for controlling well fluids (claim 1) / the gate valve assembly provided (claim 5) to be able to withstand the harsh environmental conditions present when controlling well fluids is thus a consequence of choosing D3 as the closest prior art, irrespective of whether the subject-matter of claims 1 or 5 of the main request is explicitly limited to such fluids.

4.6.3 D16 describes in paragraph [0001] and in the examples a water-mixing valve having surface-protecting layers comprising an amorphous diamond coating.

Although well fluids can comprise water, they are generally a mixture of different fluids as well as solids which exert high contact stress at elevated temperatures. Hence, a gate valve has to withstand a more extreme environment than a simple water-mixing valve, even if the water comprises some abrasive particles such as sand. Moreover, a gate valve for a well cannot be easily removed for repair and overhaul, unlike a commonly used water valve.

Therefore, the Board agrees with the reasoning in the second paragraph on page 10 of the contested decision that there is no motivation for the skilled person to consider the teaching of D16, which relates to a normal water-mixing valve, when starting from a gate valve in the context of D3.

The same reasoning applies even when considering the objective technical problem as formulated by the opponent. If aiming to provide an alternative coating for the well head according to D3, the skilled person would only consider coatings which would be a suitable coating to solve the problem forming the basis of D3.

4.6.4 D18 discloses, in paragraphs [0005] or [0011], a sliding member which can be operated in water-based environments such as those in hydraulic pumps and can be used in the food industry - see paragraph [0002] of D18. The water-based environment can be pure water, tap water or emulsions (paragraph [0010] of D18).

Hence, D18, in the same way as D16, does not relate to the same technical field as D3. A mere reference to hydraulic pumps or problems relating to oil contamination in food processing and incineration does not provide the skilled person with any motivation to consider the teaching in D18 when dealing with problems occurring in a gate valve for a well head assembly in the context of D3. Therefore, contrary to the finding in the paragraph bridging pages 10 and 11 of the contested decision, the Board cannot see any reason why the skilled person would consider the teaching of D18 when starting from a gate valve as disclosed in D3.

4.6.5 Even if D16 or D18 were consulted by a skilled person starting from the gate valve disclosed in D3, neither of them discloses that the coating on the sliding member they describe is suitable to withstand the impact from solids and the friction at elevated temperatures in a valve of a well head assembly. In particular, neither D16 nor D18 provides any hint that the coating they describe is suitable for use in a gate valve according to D3 at least in similar conditions to those of the polymeric coating containing stiffening particulates as proposed by D3.

Therefore, neither D16 nor D18 motivates the skilled person to replace the polymeric low-friction coating according to D3 by a coating as disclosed therein in order to solve the technical problem in question.

4.6.6 The further documents D1, D4, D5, D27 and D30 are no more relevant than D16 or D18. These documents confirm the knowledge of the skilled person that diamond-like carbon (DLC) and molybdenum disulfide (MoS_2) are suitable as low-friction coating and solid lubricant surface coating (see e.g. D1: sections 3 and 3.1; D4: extended abstract; D5: abstract; D27: abstract; D30: abstract).

However, none of the documents D1, D4, D5, D27 or D30 belongs to the same technical field as D3. None of them provides the skilled person with any hint that high durability of a gate valve at elevated temperatures can be achieved by replacing a polymeric low-friction coating as disclosed in D3 by a coating such as disclosed in those documents D1, D4, D5, D27 or D30. The argument that the skilled person would replace the low-friction coating in the gate valve of D3 by a coating as disclosed in any of documents D1, D4, D5,

D27 or D30 is, therefore, based on hindsight and not convincing.

4.7 In summary, the subject-matter of claims 1 and 5 of the main request is not obvious when starting from the disclosure of D3.

It follows that the ground of opposition pursuant to Article 100(a) EPC in combination with Article 56 EPC does not prejudice the maintenance of the patent as amended according to the main request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent as amended in the following version:

   Claim 1, 3-9 as granted
   Claim 2, as granted with the amendment as defined in the letter dated 23 March 2018, page 18, point 6

   Description pages 2 to 6 as granted

   Figures 1 to 7 as granted.

The Registrar: The Chairman:

C. Spira C. Herberhold

Decision electronically authenticated