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**Datasheet for the decision
of 30 May 2017**

Case Number: T 1876/14 - 3.2.08

Application Number: 06734643.7

Publication Number: 1861516

IPC: C22C21/10, C22F1/053

Language of the proceedings: EN

Title of invention:

AL-ZN-CU-MG ALUMINUM BASE ALLOYS AND METHODS OF MANUFACTURE
AND USE

Patent Proprietor:

Constellium Rolled Products Ravenswood, LLC
Constellium Issoire

Opponent:

Aleris Rolled Products Germany GmbH

Headword:

Relevant legal provisions:

RPBA Art. 12, 13
EPC Art. 100(c), 100(a), 54, 56, 87

Keyword:

Decisions cited:

T 1195/00

Catchword:



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Case Number: T 1876/14 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 30 May 2017

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted on 30 July 2014 rejecting the opposition filed against European patent No. 1861516 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman C. Herberhold
Members: M. Alvazzi Delfrate
 Y. Podbielski

Summary of Facts and Submissions

I. By its decision posted on 30 July 2014 the opposition division rejected the opposition against the European patent No. 1 861 516.

II. The appellant (opponent) lodged an appeal against this decision in the prescribed form and within the prescribed time limits.

III. At the end of the oral proceedings before the Board of appeal, held on 30 May 2017, the requests were as follows:

The appellant requested that the decision under appeal be set aside and that the patent be revoked. The appellant also requested that document D13 be admitted into the proceedings, that the respondent's auxiliary requests 2-4 not be admitted into the proceedings, and that the argument based on reference example M cited in the respondent's letter dated November 19, 2008 not be admitted into the proceedings.

The respondent (patent proprietor) requested that the appeal be dismissed or, alternatively, that the patent be maintained on the basis of auxiliary request 1 filed at the oral proceedings before the Board or one of auxiliary requests 2 to 4 filed with the reply to the statement setting out the grounds of appeal. The respondent further requested that document D13 not be admitted into the proceedings.

IV. The **main request** (patent as granted) comprises two independent claims: product claim 1 and process claim 12. Claim 1 reads as follows (claim 12 plays no role in the present decision):

"A rolled or forged Al-Zn-Cu-Mg aluminum-based alloy wrought product having a thickness from 5.08-25.4 cms (2 to 10 inches), wherein said product has been treated by solution heat-treatment, quenching and aging, and said product consists of (in weight-%):

Zn 6.6 - 7.0

Mg 1.68 - 1.8

Cu 1.7 - 2.0

Fe 0 - 0.13

Si 0-0.10

Ti 0 - 0.06

Zr 0.06 - 0.13

Cr 0 - 0.04

Mn 0 - 0.04

impurities and other incidental elements ≤ 0.05 each, balance Al."

Auxiliary request 1 is limited to product claims, with claim 1 reading as follows (amendments in respect of the main request emphasised):

"A rolled ~~or forged~~ Al-Zn-Cu-Mg aluminum-based alloy wrought product having a thickness from 5.08-25.4 cms (2 to 10 inches), wherein said product has been treated by solution heat-treatment, quenching and aging, and said product consists of (in weight-%):

Zn 6.6 - 7.0

Mg 1.68 - 1.8

Cu 1.7 - 2.0

Fe 0 - 0.13

Si 0-0.10

Ti 0 - ~~0.06~~ 0.05

Zr 0.06 - 0.13

Cr 0 - 0.04

Mn 0 - 0.04

impurities and other incidental elements ≤ 0.05 each, balance Al,
wherein said product is in an overaged temper."

Auxiliary request 2 is limited to product claims, with claim 1 reading as follows (amendments in respect of the main request emphasised):

"A rolled or forged Al-Zn-Cu-Mg aluminum-based alloy wrought product having a thickness from ~~5.08~~10.16 - ~~25.4~~22.86 cms (~~2 4~~ to ~~10 9~~ inches), wherein said product has been treated by solution heat-treatment, quenching and aging, and said product consists of (in weight-%):

Zn ~~6.6~~ 6.72 - ~~7.0~~ 6.98

Mg 1.68 - 1.8

Cu 1.75 - 2.0

Fe 0 - 0.13

Si 0-0.10

Ti 0 - 0.06

Zr ~~0.06~~ 0.08 - 0.13

Cr 0 - 0.04

Mn 0 - 0.04

impurities and other incidental elements ≤ 0.05 each, balance Al.

wherein said product has the following properties:

a) a minimum life without failure after stress corrosion cracking (SCC) of at least 50 days at a short transverse (ST) stress level of 40 ksi*,

b) a conventional tensile yield strength measured in the L direction at quarter thickness of at least 70 - 0.32t ksi* (t being the thickness of the product in inch),

c) toughness in the L-T direction measured at quarter thickness of at least 42 -1.7t ksi $\sqrt{\text{in}}$ * (t being the thickness of the product in inch*).

* 1 ksi= 6.8 MPa
1 inch = 2.54 cms"

Auxiliary requests 3 and 4 have no bearing on the present decision.

V. The following documents played a role for the present decision:

P: patent application US60/651,197 (priority of the patent in suit);
D1: Technical Report AFML-TR-73-224, September 1973, by M.V.Hyatt, "Program to improve the fracture toughness and fatigue resistance of aluminum sheet and plate for airframe applications";
D2: US -A- 2005/0167016;
D5: US -A- 2002/0121319;
D7: US -A- 2005/0150578;
D8: European Standard EN515, August 1993;
D13: correspondence relative to the request of registration of alloy AA7140;
X2bis: Affidavit of KP Smith dated 6 May 2014.

VI. The arguments of the appellant can be summarised as follows:

Main request - Article 100(c) EPC

The composition ranges of Zn, Mg and Cu of present claim 1 were not disclosed in combination in the application as originally filed. They could be found in table 1 but only as preferred (Zn) or more preferred ranges (Mg and Cu). Thus, their combination was a multiple selection which was not originally disclosed. Indeed, different ranges for Mg and Cu were disclosed

in the passage following table 1 on page 7, lines 3-5. Therefore, claim 1 comprised added subject-matter.

Main request - priority

The priority document P did not disclose the lower limit of 1.68 wt% for the Mg content in combination with the ranges for the other elements as stipulated by present claim 1. While the former was disclosed in claim 15 the latter were stipulated in claims 6 and 7. There was no disclosure that said claims could be combined, but rather they appeared, in view of the different Mg contents, to refer to different embodiments.

Moreover, P did not disclose a plate treated by solution heat-treatment, quenching and aging but merely an overaged product.

For these reasons, the priority claim was invalid.

Admission of D13 into the proceedings

D13 had been filed at the beginning of the appeal proceedings in reaction to the submission of document X2bis shortly before the oral proceedings in opposition. In the latter document it was stated that the claimed alloy was commercialized under the alloy registration AA7140. Since D13 related to the same alloy AA7140, it was *prima facie* relevant and should be admitted into the proceedings.

Main request - novelty

The subject-matter of claim 1 lacked novelty in view of each D1, D2, D5, D7 and D13.

D7 was prior art due to the invalid priority and related to wrought Al alloy products which were solution heat treated, quenched and aged. Plates of various thicknesses could be produced. For instance example 2 disclosed a thickness in accordance with claim 1. It was clear that the thickness of example 2 was not linked to its specific composition but could be obtained also for the other compositions disclosed in D7. The broad composition of D7 overlapped with the composition of present claim 1. The contents of Cu, Mg and Zn of the examples of D7 were either in the presently claimed range or not far removed from it. Hence, the person skilled in the art would have seriously contemplated working in the composition range of claim 1 of the main request. The preferred restriction of less than 0.80 on the Mg/Cu ratio described in D7 would not have constituted an obstacle in this sense because even example Y of D7 did not comply with it. Thus, the subject-matter of claim 1 lacked novelty over D7.

D5 also disclosed wrought Al alloy products with a broad composition which overlapped the claimed one. Example B of table 4 had contents of Zn, Cu and Zr in accordance with the present claim and a Mg content of 1.5%, which was not far removed from the lower limit of the claimed range. Moreover, paragraph [0023] disclosed the value of 1.68% for the Mg content. Thus, the subject-matter of claim 1 lacked novelty over D5 too.

D2 likewise disclosed an Al alloy with a composition overlapping with the claimed one. Although none of the examples had a Zn content in accordance with claim 1 there was no teaching in D2 preventing the person skilled in the art from working in the claimed range.

Thus, the person skilled in the art would have seriously contemplated doing so. Hence, the subject-matter of claim 1 was also not novel over D2.

D1 disclosed two compositions in accordance with claim 1. Even if D1 did not explicitly disclose a wrought product with a thickness in accordance with claim 1, the mention of a plate was an implicit disclosure of such a thickness. Hence, the subject-matter of claim 1 was also not novel over D1.

D13 comprised a letter dated 7 April 2005 (i.e. in the priority interval of the patent in suit) of FEDEM, wherein a chemical composition essentially corresponding to the claimed alloy was submitted for registration as alloy 7140. There was no confidentiality involved in respect of the alloy composition. Even if D13 did not explicitly disclose the thickness of the products to be obtained the references to a "plate in aerospace applications" and to alloy 7040 indicated that thicknesses in the claimed range were contemplated. Hence, D13 was also novelty-destroying.

Admission of the auxiliary requests into the proceedings

Auxiliary request 1 was filed at a very late stage of the appeal proceedings. Auxiliary requests 2-4 were filed together with the reply to the statement of grounds but were not substantiated. Hence, auxiliary requests 1-4 should not be admitted into the proceedings.

Auxiliary request 1 - priority

The claimed priority was still invalid for the reasons explained for the main request.

Auxiliary request 1 - novelty

In example 3 of D7 two treatments were disclosed where the product was overaged. It was clear that these treatments could be applied to all the compositions disclosed in D7. Therefore, the subject-matter of claim 1 of auxiliary request 1 was not novel.

Auxiliary request 1 - inventive step

In any event it was at least obvious to overage the known products of D7 to provide a compromise between mechanical properties and corrosion resistance, because this was known from the common general knowledge evidenced by D8, in particular figure 1. Thus, the subject-matter of claim 1 of auxiliary request 1 did not involve an inventive step.

Auxiliary request 2 - priority

Also for auxiliary request 2 the claimed priority was invalid for the reasons given for the main request.

Auxiliary request 2 - novelty

It was clear that in D7 a thickness within the range of claim 1 of auxiliary request 2 could also be obtained. The properties listed in claim 1 were the inherent result of the application of process C of example 3. Hence, the subject-matter of claim 1 lacked novelty.

Auxiliary request 2 - inventive step

In any event it was at least obvious to apply the process C of example 3 to all the compositions disclosed in D7, and thus arrive at the claimed product. Moreover, the properties stipulated by claim 1 were generally envisaged by the skilled practitioner and thus could not justify an inventive step, as explained in decision T 1195/00. Thus, the claimed product was obvious starting from D7.

Additionally, it was also obvious to arrive at the claimed product starting from D5 or D2. In both cases the distinguishing feature of the claimed product could be regarded as the composition. Since D1 taught on page 50 that increased Mg and Zn contents, in accordance with present claim 1, were beneficial for the mechanical properties, it was obvious to modify the products of D5 or D2 in the way claimed.

Therefore, the subject-matter of claim 1 of auxiliary request 2 did not involve an inventive step.

VII. The arguments of the respondent can be summarised as follows:

Main request - Article 100(c) EPC

It was clear to the person skilled in the art that the preferred and more preferred ranges of table 1 could be combined with each other. Hence, the subject-matter of claim 1 of the main request was disclosed in the application as originally filed.

Main request - priority

Claim 15 of the priority document P disclosed the lower limit of 1.68 wt% for the Mg content. The ranges for the other elements were disclosed in claims 6 and 7. Both claims 6 and 15 were *de facto* dependent claims of claim 1, and could thus be combined with each other. Hence, the composition of claim 1 of the main request was disclosed in the priority document.

The feature that the plate was treated by solution heat-treatment, quenching and aging was disclosed in claims 10 and 11, which described a type of aging.

Therefore, the priority claim was valid.

Admission of D13 into the proceedings

Document D13 was filed late and was not *prima facie* relevant. Hence, it should not be admitted into the proceedings.

Main request - novelty

None of the documents D1, D2, D5, D7 and D13 was novelty-destroying.

D7 disclosed a thickness in accordance with claim 1 solely in example 2, which, however, did not exhibit a composition in accordance with claim 1. Indeed a specific composition in accordance with claim 1 was not disclosed in D7 at all. The specific examples were far removed from the claimed composition. The person skilled in the art would have worked in the middle of the composition ranges disclosed in D7, thus with a Cu content higher than the presently claimed range. In any

event, modifying the examples to work within the claimed range would be at odds with the Mg/Cu ratio of less than 0.8 stipulated in paragraph [0031]. Hence, D7 did not disclose all the features of claim 1. Should the provision of an effect in respect of the alloy of D7 by the claimed composition be relevant to novelty, example M and the arguments in its respect should also be considered.

All the examples of D5 had a Mg content lower and far removed from the range of present claim 1. The value of 1.68% was disclosed solely as an upper limit of the most preferred range but there was no indication that this amount of Mg was actually to be used, especially in view of the limitations on the sum of Mg and Cu taught by D5.

Also in D2 none of the examples was in accordance with the claimed composition, in particular in respect of the Zn content.

D1 disclosed a composition in accordance with claim 1, but not with the required thickness.

Nor was such a thickness disclosed in D13.

Therefore, the subject-matter of claim 1 was novel.

Admission of the auxiliary requests into the proceedings

Auxiliary request 1 was based on a combination of claims 1 and 3 of previous auxiliary request 1 and took into account the debate on priority at the oral proceedings.

Auxiliary requests 2-4 were filed together with the reply to the statement of grounds and were substantiated.

Therefore, auxiliary requests 1-4 should be admitted into the proceedings.

Auxiliary request 1 - priority

Auxiliary request 1 addressed one of the objections raised against the priority for the main request.

Auxiliary request 1 - novelty

Although two of the three treatments of example 3 of D7 were overaging treatments, D7 did not disclose that they were to be applied to a composition in accordance with present claim 1. Therefore, the subject-matter of claim 1 was novel.

Auxiliary request 1 - inventive step

The overaging treatment enabled an improved compromise among mechanical strength, fracture toughness and resistance to stress corrosion. Starting from D7 there was no hint, neither in D7 itself nor in the common general knowledge represented by D8, that by overaging the composition of present claim 1 the specific properties listed in claim 8 as granted could be achieved. Hence, it was not obvious to perform overaging. Therefore, the subject-matter of claim 1 of auxiliary request 1 involved an inventive step.

Auxiliary request 2 - priority

The considerations made for the main request applied also to auxiliary request 2.

Auxiliary request 2 - novelty

Neither a thickness within the range of claim 1 nor the claimed combination of properties were disclosed in D7. Hence, the subject-matter of claim 1 of auxiliary request 2 was novel.

Auxiliary request 2 - inventive step

Starting from D7, it was not obvious to obtain a product with the properties of claim 1, which provided an improved compromise between mechanical strength, fracture toughness and resistance to stress corrosion. Even if the person skilled in the art had envisaged such a product, he had no obvious way to obtain it.

Nor was it obvious to arrive at the claimed product starting from D5 or D2. In particular there was no hint in the prior art to modify the compositions of these documents in the claimed way. The teaching of D1 in respect of Mg related to thin products and would not be applied to thicker products as presently claimed. In case of D2, claim 1 of auxiliary request 2 was also distinguished by the Zr content, which was a central issue in D2 and which the person skilled in the art had no reason to modify.

Therefore, the subject-matter of claim 1 of auxiliary request 2 involved an inventive step.

Reasons for the Decision

1. Main request - Article 100(c) EPC

Claim 1 as originally filed discloses a rolled or forged Al-Zn-Cu-Mg aluminum-based alloy wrought product having a thickness from 2 to 10 inches, which has been treated by solution heat-treatment, quenching and ageing. The composition of said product, notably in respect of the contents of Zn, Mg and Cu, is not identical with that of present claim 1 but encompasses it.

The ranges of Zn, Mg and Cu of present claim 1 are disclosed in the original application in table 1, which refers to one advantageous embodiment of the claimed invention (page 6, lines 25-26), as preferred range (Zn) and more preferred ranges (Mg and Cu).

There is no indication in the application that the more preferred contents of Mg and Cu can only be associated with the more preferred content of Zn. Hence, it is clear to the person skilled in the art that, in the framework of said advantageous embodiment, they can also be associated with the broader preferred range of Zn. Thus, the combination of ranges of present claim 1 is disclosed in the application as originally filed.

The fact that different ranges for Mg and Cu are disclosed in the passage following table 1 (page 7, lines 3-5) is immaterial because said passage refers to "still another embodiment of the invention".

Therefore, claim 1 of the main request does not comprise added subject-matter.

2. Main request - priority

2.1 The priority document P consists merely of a set of claims. The only claims reciting a lower limit of 1.68 wt% for the Mg content are independent claim 15 and dependent (on claims 16 to 17) claim 18. None of them discloses the ranges of present claim 1 for the other elements (for instance the lower limit for the Zn content of 6.6 wt%), which are instead to be found in claims 6 and 7 of the priority document.

The respondent argued that both claims 6 and 15 were dependent claims of claim 1, and that the composition ranges of said dependent claims could thus be combined with each other. The Board does not share this view, since the priority document, which has no description attached to the claims, gives no indication that claims 6 and 15 (or 18) relate to the same embodiment of the more general composition disclosed in claim 1. On the contrary, the person skilled in the art would rather understand that claims 6 and 15 relate to two different embodiments, one with low Mg content (1.5-1.8 wt%) in claim 6 and one with high Mg content (1.68- 2.4 wt%) in claim 15 and claim 18.

Hence, the priority document does not disclose a plate with the composition of present claim 1. Therefore, the priority claim is not valid.

2.2 Additionally, the priority document does not disclose a plate treated by solution heat-treatment, quenching and aging but merely an overaged product (claims 10 and 11). A basis for generalising it to an aged product is

not provided in the priority document. Therefore, the priority claim is invalid also for this reason.

3. Admission of D13 into the proceedings

Document X2bis, a declaration of one of the co-inventors of the patent in suit submitted by the respondent, states inter alia that the products made in accordance with the patent can be commercialized under the alloy registration AA7140. Thus, D13, a collection of letters dated in the priority interval of the patent in suit and relating to the registration of the very same alloy AA7140, is *prima facie* relevant to the issue of novelty of the claimed composition.

Moreover, since X2bis was filed shortly before the oral proceedings before the opposition division, the submission of D13 together with the grounds of appeal is considered to be a timely reaction to the filing of X2bis.

Therefore, the Board decided to admit D13 into the proceedings (Article 12 RPBA).

4. Main request - novelty

Novelty has been objected to in view of each D1, D2, D5, D7 and D13.

4.1 D7 forms part of the state of the art due to the invalid priority. It relates to wrought Al alloy products, in particular rolled or forged or extruded, which are solution heat treated, quenched and aged (claim 1 and abstract).

The alloy of D7 can be applied to the production of plates with different thicknesses, comprising plates thicker than 20 mm (paragraph [0030]). In example 2 a plate with a thickness within the range of present claim 1 is produced (25.4 mm, see paragraph [0083]). D7 does not disclose any limitation on the alloy composition depending on the thickness to be obtained. Instead, depending on the thickness different types of solution heat treatments are to be used (paragraph [0039]). It is thus clear that plates with thicknesses in the claimed range can be produced not only for the specific composition of example 2 (which does not fall within the ranges of present claim 1) but for all the compositions taught by D7.

The broad composition of D7 comprises (in wt%) 6.7-7.3 Zn, 1.9-2.5 Cu, 1.0-2.0 Mg, 0.04-0.15 Zr and optional contents of Fe and Si, with a Mg/Cu ratio smaller than 1 (abstract). It thus overlaps with the composition of present claim 1.

The broad composition cannot be considered to disclose all the specific values comprised in it. At the same time, the disclosure of D7 is not limited to the specific examples disclosed in this document. Rather it should be assessed, on the basis of the teaching of the whole document D7, in which region of the broad composition the person skilled in the art would seriously contemplate working. While in some cases the person skilled in the art would be directed towards the middle of the prior-art ranges as argued by the respondent, this is not always the case. In particular, when examples are present, the person skilled in the art would normally consider that the region in the vicinity of said examples is to be contemplated.

D7 discloses two specific inventive compositions in the examples, whose contents of Cu, Mg and Zn are given in the following table, together with the corresponding ranges of present claim 1 (the contents of the further alloying elements are in accordance with present claim 1 for both the examples).

	<i>Cu</i>	<i>Mg</i>	<i>Zn</i>
<i>Ex. N</i>	2.05	1.64	7.08
<i>Ex. Y</i>	2.16	1.80	6.76
<i>Claim 1</i>	1.7-2.0	1.68-1.8	6.6-7.0

Example N (see paragraph [0065], table 1) has a Cu content (2.05%) that is not far removed from the claimed range. Thus, an alloy with a Cu content within the claimed range would be seriously contemplated by the reader of D7. Contents of Mg and Zn within the claimed range would be likewise seriously contemplated, since in the examples the contents of these elements either fall in the claimed region (example Y) or are not far removed from it (example N), with the region between examples Y and N falling mostly within the claimed composition.

It is true that in D7 a Mg/Cu ratio of less than 0.80% is preferred (paragraph [0031] and claim 6), and that working with a Mg and Cu content in accordance with present claim 1 would be contrary to said condition. However, example Y does not comply with said preferred condition, because it has a Mg/Cu ratio of 0.83. Hence, the person skilled is taught that it is not necessary to comply with said preferred condition but also compositions can be considered that comply only with the more general condition on Mg/Cu (smaller than 1). Since working within the presently claimed range is

not at odds with said more general condition, the person skilled in the art would seriously contemplate doing it.

Thus, the subject-matter of claim 1 lacks novelty over D7.

In view of the above analysis, whether or not an effect in respect of the alloy of D7 is provided by the claimed composition is immaterial. The arguments relating to reference example M related to the provision or not of said effect and had been submitted by the respondent only in case that this issue should become relevant. Hence, there is no need to consider whether to admit them or not (as requested by the appellant) into the proceedings.

4.2 Contrary to D7, the other documents cited against novelty, do not disclose the subject-matter of claim 1.

4.2.1 D5 relates to wrought Al alloy products with a broad composition (claim 1) which overlaps with the claimed one, inter alia in respect of the Mg content (1.2 to 1.9 wt%). All the examples of D5 exhibit compositions which do not fall within the scope of claim 1. In particular, example B of table 4, which is undisputedly the most relevant one, has contents of Zn, Cu and Zr in accordance with the present claim but a Mg content of 1.5%, which is far removed from the lower limit of the claimed range (a distance of 0.18 wt%, i.e. about 26% of the width of the Mg range disclosed in D5).

It is true that paragraph [0023] discloses the value of 1.68% for the Mg content, but this value is an upper limit of the most preferred range, which is not disclosed in combination with values in accordance with

present claim 1 for the other alloying elements. Indeed, the exemplary inventive compositions of table 2, which studies the effect of the composition on strength and toughness, exhibit at most 1.55% Mg. D5 teaches that for thick products the Mg content must be kept low (see paragraph [0078]). An important aspect of the invention of D5 resides in the low content of Cu and Mg, both around 1.5% (see paragraph [0062]) with the sum of Mg and Cu preferably not exceeding 3.5%, more preferably 3.3% (paragraph [0032]). While the examples of table 4, which exhibit a Mg content of 1.5%, comply with at least said preferred condition on the sum of Mg and Cu, modifying example B by an increase of the Cu content in accordance with present claim 1 would be at odds with it.

Hence, there is no teaching in D5 that would lead the person skilled in the art to seriously contemplate working within the claimed composition, in particular in respect of the Mg content. Therefore, the subject-matter of claim 1 is novel over D5.

4.2.2 D2 also discloses (paragraph [0018] and claim 2) an Al alloy with a composition overlapping with the claimed one. The region of overlap is small in comparison with the range disclosed in D2 (for instance already considering Zn alone the overlap is 20%). None of the examples of table 1 (of which, in view of the Zr content, the only inventive example is plate number 859188) has a composition according to present claim 1. In particular, the Zn content in all the examples is well below the claimed one (more than 20% of the range disclosed by D2).

The appellant argued that there was no teaching in D2 preventing the person skilled in the art from working

in the range of present claim 1. However, the lack of a negative teaching is not sufficient to conclude that the person skilled in the art would indeed have seriously contemplated working in the claimed range. Hence, the subject-matter of claim 1 is also novel over D2.

4.2.3 D1 discloses two compositions in accordance with claim 1 (table 12 on page 53). It is, however, undisputed that D1 does not explicitly disclose a wrought product with a thickness in accordance with claim 1. Rather, the thicknesses disclosed for said compositions in D1, which is a research document, are smaller (see table 13 or table 15). The appellant's argument that given the mention of a plate (see for instance the title of D1) a thickness in accordance with claim 1 would be implicitly disclosed is not convincing since the thickness of a plate can also be outside the claimed range. Hence, the subject-matter of claim 1 is also novel over D1.

4.2.4 D13 comprises a letter dated 7 April 2005 (i.e. in the priority interval of the patent in suit) of FEDEM, wherein a chemical composition is submitted for registration as alloy 7140. At least in view of the mention that the alloy was offered for sale and supplied in commercial quantities in the previous 12 months it is clear that there is no confidentiality involved in respect of the alloy composition. Therefore, through this letter the composition of alloy 7140 has been made available to the public. However, D13 gives no information in respect of the thickness of the products to be obtained or the thermal treatments. Also the references to "plate in aerospace applications" (see letter of 7 April 2005 in D13) and to the alloy 7040 (see letter of 18 May 2005 in D13) do

not clearly and unambiguously disclose a thickness in accordance with claim 1, because plates for aerospace applications may exhibit thicknesses outside the claimed range and alloy 7040 may be used for products different from the claimed one. Hence, D13 is not novelty-destroying either.

5. Admission of the auxiliary requests into the proceedings

5.1 Auxiliary request 1 was filed at a very late stage of the appeal proceedings, namely at the oral proceedings. Its submission was a reaction to the debate concerning the priority during said oral proceedings. Moreover, its claim 1 is merely a combination of claims 1 and 3 of previous auxiliary request 1, which was submitted together with the reply to the statement of grounds and the admission of which into the proceedings had not been disputed. Hence, the Board considered that, despite its extreme delay this request did not rise any issue which the parties could not deal with during the oral proceedings and decided to admit it into the proceedings (Article 13 RPBA).

5.2 Auxiliary requests 2-4 were filed together with the reply to the statement of grounds, i.e. at the earliest possible stage of the appeal proceedings. The appellant argued that auxiliary requests 2 to 4 were not substantiated and thus should not be admitted into the proceedings. However, the respondent has explained in the reply to the statement of grounds how these requests are restricted. Since the main issues discussed in the grounds of appeal are novelty and inventive step, it is clear that these further limitations are meant to provide novelty and inventive step, if these were denied for a higher-ranking

request. Hence, the Board considered that auxiliary requests 2-4 are substantiated in the reply to the statement of grounds and decided to admit them into the proceedings.

6. Auxiliary request 1 - priority

The amendments to auxiliary request 1, specifying that the product is overaged, remove only one of the two reasons for which the priority claim of the main request has been found invalid. Therefore, the claimed priority is still invalid.

7. Auxiliary request 1 - novelty

According to paragraph [0042] of D7 the products are submitted to an artificial aging that has a large influence on the final properties. Depending on the required compromise a two-step or a single step artificial aging may be preferred. Several aging treatments are mentioned in the examples. It is true that in example 3 two treatments (table 10, process B and C) are disclosed in which the product is overaged. However, example 3 does not disclose that the composition of the product (alloy P which is similar to alloy M) is in accordance with present claim 1. D7 does not provide any indication that treatments B and C of example 3 are to be applied to other compositions. Nor would the person skilled in the art assume so, because he knows that heating treatments are specific to the composition and the thickness of the alloy to be treated. Hence, D7 does not clearly and unambiguously disclose an overaged product with a composition in accordance with claim 1. Therefore, the subject-matter of claim 1 is novel.

8. Auxiliary request 1 - inventive step

Starting from D7 the problem solved by means of the choice of overaging as an aging treatment is to enable an improved compromise among mechanical strength for an appropriate level of fracture toughness and resistance to stress corrosion (paragraph [0011] of the patent in suit). The specific properties listed in claim 8 as granted are not part of present claim 1 and thus cannot be taken into account when formulating said problem.

The person skilled in the art knows from the common general knowledge that overaging provides a compromise of mechanical strength, fracture toughness and resistance to stress corrosion (see D8, point 7.3.3 and figure 1). Thus, it was obvious for him to choose overaging to solve the problem above.

Hence, the subject-matter of claim 1 of auxiliary request 1 does not involve an inventive step.

9. Auxiliary request 2 - priority

It is undisputed that auxiliary request 2 could not validly claim the priority.

10. Auxiliary request 2 - novelty

D7 does not explicitly disclose a thickness within the range of claim 1 and is silent about the resistance to stress corrosion cracking. The appellant argued in respect of the latter feature that it would be inherent in a product with the composition of claim 1 to which the process C of example 3 of D7 had been applied. However, as explained above in connection with auxiliary request 1, D7 does not disclose directly and

unambiguously the application of process C to any alloy different from alloy P (which is not disclosed as an alloy with a composition according to claim 1) to which said example refers. At least for this reason, the subject-matter of claim 1 of auxiliary request 2 is novel.

11. Auxiliary request 2 - inventive step

11.1 Also in the case of auxiliary request 2 the problem solved starting from D7 is to enable an improved compromise among mechanical strength for an appropriate level of fracture toughness and resistance to stress corrosion (paragraph [0011] of the patent in suit).

This problem is solved in accordance with claim 1 by the combination of stress corrosion cracking resistance, tensile yield strength and toughness stipulated by the claim.

The appellant argued that from D7 it would be at least obvious to apply the aging of process C of example 3 to alloys with a composition according to present claim 1, obtaining a product with the properties of claim 1. However, D7 does not disclose that process C is advantageous for solving the problem above. In particular, D7 is completely silent as far as the corrosion resistance is concerned. The possibility of obtaining a product with the claimed properties is thus hidden to the reader. Hence, D7 alone does not render it obvious to apply process C to any alloy different from alloy P, in particular to an alloy of a different thickness and composition according to present claim 1, to solve the problem above.

Nor is the claimed product rendered obvious when D7 is combined with the common general knowledge of the person skilled in the art. In order for a product to be obvious it is not enough that said product exhibit properties generally envisaged by the skilled practitioner, but there must also be a known way or an applicable method in the art for making it (see the decision T 1195/00 cited by the appellant, point 5.6).

In the present case the patent in suit discloses the obtention of the claimed product by means of a specific overaging process, comprising aging the plate by heating at 230-250 °F for 5 to 12 hours and 300-360 °F for 5 to 30 hours, for an equivalent time $t_{(eq)}$ between 31 and 56 hours (paragraphs [0031]-[0034]). In contrast, other overaging treatments may not result in a product with the claimed properties (example 2, see in particular table 5). Hence, the common general knowledge as evidenced by D8, which does not give any detail of the overaging treatment, does not give sufficient information to allow the person skilled in the art to obtain a product with the claimed properties.

Therefore, it was not obvious to arrive at the claimed product starting from D7.

- 11.2 The two further inventive-step attacks put forward by the appellant, starting from D5 or D2 in both cases in combination with D1, equally fail to convince the Board of the obviousness of the claimed product.

The composition of claim 1 differs from the composition of D5 by a higher Mg content. It is true that a composition with a Mg content in accordance with claim 1 is disclosed in D1, page 50 (table 10 "alloy

selected") where it is also stated that Zn and Mg were increased to meet extra strength requirements (point 3 on page 50). However, this teaching relates to thin products (0.16 in, see page 48, first paragraph of point 2.6.1). D5 in paragraph [0078], explicitly states that the conventional design philosophies for 7XXX series alloys, which indicate that higher Mg contents provide high strength, are not applicable to thicker products, because higher Mg increases quench sensitivity and reduces strength. Hence, given that the claimed products have a thickness between 4 and 9 inches, starting from D5 it was not obvious to choose a Mg content as taught by D1 in the context of thinner products. Therefore, the subject-matter of claim 1 involves an inventive step starting from D5.

In claim 1 of auxiliary request 2 the Zr content has been further restricted in respect of granted claim 1 to the range 0.08-0.13%. By contrast, in D2 the Zr content is 0.04-0.09%, preferably 0.05 to 0.07% and in the sole inventive example Zr is 0.06% (table 1, plate number 859188). Hence, the person skilled in the art would not seriously contemplate working with a Zr content according to claim 1 of auxiliary request 2, the composition of which differs from the composition of D2 not only by the content of Zn (which represented a difference already for granted claim 1, see above), but also by the content of Zr. While D1 teaches (page 50) to increase the Zn content, it does not provide any hint to select a Zr content according to claim 1. Therefore, the subject-matter of claim 1 involves an inventive step also starting from D2.

11.3 Therefore, the subject-matter of claim 1 of auxiliary request 2 involves an inventive step.

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 on the basis of the following documents:
 - Claims 1 to 7 according to auxiliary request 2 filed with letter dated 2 April 2015;
 - Description, pages 2-9 filed during the oral proceedings;
 - Figures 1 and 2 as granted.

The Registrar:

The Chairman:



C. Moser

C. Herberhold

Decision electronically authenticated