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**Datasheet for the decision  
of 22 September 2015**

**Case Number:** T 0107/14 - 3.2.08

**Application Number:** 07250977.1

**Publication Number:** 1835041

**IPC:** C22C19/05

**Language of the proceedings:** EN

**Title of invention:**  
Nickel alloy welding wire

**Patent Proprietor:**  
United Technologies Corporation

**Opponent:**  
Siemens Aktiengesellschaft

**Headword:**

**Relevant legal provisions:**  
EPC Art. 100(c), 100(b), 100(a), 56, 112(1)

**Keyword:**  
Grounds for opposition - added subject-matter (no)  
Grounds for opposition - insufficiency of disclosure (no)  
Inventive step  
Referral to the Enlarged Board of Appeal - (no)

**Decisions cited:**  
T 0725/08, T 0759/10

**Catchword:**



**Beschwerdekammern  
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Case Number: T 0107/14 - 3.2.08

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.08**  
**of 22 September 2015**

**Appellant:** Siemens Aktiengesellschaft  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 9 December 2013  
rejecting the opposition filed against European  
patent No. 1835041 pursuant to Article 101(2)  
EPC.**

**Composition of the Board:**

**Chairman** T. Kriner  
**Members:** M. Alvazzi Delfrate  
C. Schmidt

## **Summary of Facts and Submissions**

- I. By its decision posted on 9 December 2013 the opposition division rejected the opposition against European patent No. 1835041.
- II. The appellant (opponent) lodged an appeal against that decision in the prescribed form and within the prescribed time limit.
- III. Oral proceedings before the Board of Appeal were held on 22 September 2015.
- IV. The appellant requested that the decision under appeal be set aside and that the patent be revoked. As an auxiliary request it requested that the following questions be referred to the Enlarged Board of Appeal:
1. Is the term "consisting of" considered directly and unambiguously derivable from the solely used term "comprising", such that no new subject-matter is introduced by an amendment of the term "comprising" to the term "consisting of"?
  2. If the answer to question 1 is yes, is a compound "consisting of" essential elements and optional elements considered directly and unambiguously derivable from a disclosure of a first list of the essential elements to be "comprised" and a second list of optional elements to be comprised by the compound?
- V. The respondent (patent proprietor) requested that the appeal be dismissed or, in the alternative, that the patent be maintained on the basis of one of auxiliary request 1 or 2 filed with letter of 29 July 2014.

VI. The independent claims of the **main request** (patent as granted) read as follows:

"1. A nickel alloy wire to be used in effecting repairs to nickel based superalloy components, said nickel based alloy being formed from a material consisting of from 4.75 to 5.25 wt% chromium, from about 5.5 to 5.8 wt% aluminum, from 5.6 to 6.2 wt% tungsten, from 8.0 to 8.3 wt% tantalum, from 1.7 to 2.1 wt% molybdenum, from 9.5 to 10.5 wt% cobalt, from 2.8 to 3.2 wt% rhenium, from 0.07 to 0.30 wt% carbon, from 0.02 to 0.04 wt% boron, from 0.08 to 0.12 wt% zirconium, from 0.08 to 0.12 wt% yttrium, from 1.0 to 1.5 wt% hafnium, up to 0.12 wt% manganese, up to 0.12 wt% silicon, up to 0.015 wt% phosphorous, up to 0.015 wt% sulfur, up to 0.20 wt% iron, up to 0.10 wt% copper and the balance nickel."

"3. A method for repairing a crack in a nickel based superalloy component comprising the steps of:

providing a workpiece having a crack;

heating said workpiece to a temperature in the range of from about 1625 to 1675 degrees Fahrenheit (about 885°C to about 913°C) for a time in the range of from about 2.0 to 3.0 minutes; and

repairing said crack by applying a welding wire formed from a nickel based alloy having a composition consisting of 4.75 to 5.25 wt% chromium, from 5.5 to 5.8 wt% aluminum, from 5.6 to 6.2 wt% tungsten, from 8.0 to 8.3 wt% tantalum, from 1.7 to 2.1 wt% molybdenum, from 9.5 to 10.5 wt% cobalt, from 2.8 to 3.2 wt% rhenium, from 0.07 to 0.30 wt% carbon, from 0.02 to 0.04 wt% boron, from 0.08 to 0.12 wt% zirconium, from 0.08 to 0.12 wt% yttrium, from 1.0 to

1.5 wt% hafnium, up to 0.12 wt% manganese, up to 0.12 wt% silicon, up to 0.015 wt% phosphorous, up to 0.015 wt% sulfur, up to 0.20 wt% iron, up to 0.10 wt% copper and the balance nickel to said crack and maintaining said temperature until said material flows into and fills said crack."

The auxiliary requests are not relevant for this decision.

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

D5: WO -A- 95/35396;

D14: P. Spiekermann "Legierungen - ein besonderes patentrechtliches Problem?" Mitteilungen der deutschen Patentanwälte (1993), pages 178-190

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

*Article 100(c) EPC*

Claim 1 as originally filed was directed to a composition "comprising" a plurality of alloying elements. Therefore, it related to an open composition, as was also clear from the fact that further alloying elements were added in dependent claim 3. The use of the word "balance" in original claim 1 did not change that, because this wording merely meant that the majority of the alloy was constituted by Ni, but did not exclude further elements.

By contrast, granted claim 1 was directed to an alloy "consisting" of a plurality of alloying elements, i.e. a closed composition which did not allow the presence

of further elements. A closed composition was not the same as an open one. This was also clear from the practice of the EPO, documented by D14, to object to the latter as lacking clarity.

The change from an open to a closed composition in claim 1 resulted in an addition of subject-matter which was not disclosed in the application as originally filed. In this respect reference was made also to T 725/08 and T 759/10.

*Article 100(b) EPC*

Reference was made to the written proceedings, where it had been argued that the weld wire of claim 1 was not suitable for repairing any Ni-based superalloy, because the boron content should be varied according to the substrate to be repaired. Therefore, the claimed invention was not sufficiently disclosed.

*Inventive step*

Claim 27 of D5 represented the most relevant prior art. The sole difference of claim 1 of the main request in respect of this prior art was the higher content of B. This was because in the preferred repair method of D5, which employed laser cladding, there was no need to use large quantities of B. However, the person skilled in the art knew that when the alloy of claim 27 was to be used in a repair process involving welding, the melting point of the welding wire was to be lowered, and that an increased amount of B could be used for this purpose. D5 itself described this effect of B on page 6, rendering it obvious to adopt this measure. The disadvantages mentioned on page 14 were not a hindrance in this sense, since they concerned only laser

cladding. Since there was no need to modify the content of other alloying elements it was obvious to modify the alloy of claim 27 by simply increasing the B content, i.e. in the sense of claim 1. Therefore, the subject-matter of this claim did not involve an inventive step.

*Request to refer questions to the Enlarged Board of Appeal*

There were divergencies in the case law concerning the replacement of "comprising" with "consisting of" in the case of a composition. For instance, decisions T 0725/08 and T 0759/10 deviated from the earlier jurisprudence which allowed this amendment. Therefore, to clarify this point of law it was necessary to refer the proposed questions to the Enlarged Board of Appeal.

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

*Article 100(c) EPC*

It was true that claim 1 as originally filed was directed to a composition "comprising" a plurality of alloying elements. However, the claim recited also that the balance, i.e. the rest, of the composition was Ni. Therefore, claim 1 as originally filed was already directed to a closed composition. The same applied to claim 3 which, by its reference to claim 1, also incorporated the feature that the balance of the composition was Ni. Therefore, the change of wording from "comprising" to "consisting of" did not involve any change of meaning in respect of the originally filed claims. Accordingly, no subject-matter extending

beyond the content of the original application had been added.

*Article 100(b) EPC*

Reference was made to the arguments submitted in the written proceedings, where it had been argued that the patent sufficiently described how to realise the claimed wire and use it in a method for repairing a crack.

*Inventive step*

Claim 27 of D5 represented the most relevant prior art. Starting from this prior art the invention provided a wire for repairing cracks by welding in materials exhibiting strength and oxidation resistance at high temperature. D5 led away from the claimed solution since it did not relate to welding and disclosed higher amounts of B as disadvantageous. Therefore, the subject-matter of claim 1 of the main request involved an inventive step.

*Request to refer questions to the Enlarged Board of Appeal*

There was no need to refer the questions proposed by the appellant to clarify a point of law.

**Reasons for the Decision**

1. Article 100(c) EPC and the request that two questions be referred to the Enlarged Board of Appeal



1.1 According to the appellant, claim 1 extends beyond the content of the application as filed because it is directed to an alloy "consisting of" the given elements, whereas claim 1 as originally filed relates to an alloy "comprising" the given elements.

However, claim 1 as originally filed stipulates also that Ni represents "the balance" of the composition. This wording clearly and unambiguously discloses that the rest of the composition consists of Ni, not allowing for the presence of further elements. In other words, claim 1 as originally filed did not relate to an open composition (of the type whose clarity is discussed in D14) but was already directed to a closed composition, i.e. an alloy which consists of the given elements.

The fact that dependent claim 3 lists further alloying elements does not change this finding, since claim 3 is merely to be seen as a "false dependent claim" which relates to another composition consisting of the elements listed in both claims 1 and 3. Moreover, by its reference to claim 1, claim 3 incorporates the feature that the balance of the composition is Ni. Hence, it also does not allow further undisclosed alloying elements to be present in addition to those mentioned in these claims.

Since the originally filed claims are already directed to closed compositions, there is no doubt that the composition stipulated by present claim 1, "consisting of" the given elements, is already disclosed in the application as originally filed.

Decisions T 0725/08 and T 0759/10, cited by the appellant to support its view that the amendment is not

allowable, fail to convince the Board to the contrary. Whether a particular amendment extends beyond the content of the application as originally filed is neither a point of law nor a matter to be decided only on the basis of the amendment in isolation. Rather, it must be judged on the basis of the information clearly and unambiguously disclosed in the whole application as originally filed, i.e. on the merits of the specific case. Therefore, the situation to be considered in the present case is not the same as those underlying T 0725/08 and T 0759/10, and the findings of those decisions cannot be transposed to the present case. In any event, although in these decisions the replacement of the word "comprising" by "consisting essentially of" was found to contravene Article 123(2) EPC, the replacement of the word "comprising" by "consisting of" was actually allowed (see T 0725/08, points 5.4 to 5.6 and T 0759/10, point 7.1).

Hence, the patent as granted (main request) does not comprise subject-matter which extends beyond the content of the application as originally filed.

- 1.2 The Board was able to come to these findings without referring to the Enlarged Board of Appeal the questions submitted by the appellant.

According to Article 112(1)(a) EPC, in order to ensure uniform application of the law, or if a point of law of fundamental importance arises, the Board of Appeal, either of its own motion or following a request from a party to the appeal, will refer any question to the Enlarged Board of Appeal if it considers that a decision is required for the above purposes.

In the present case, the questions submitted by the appellant relate to the allowability of a particular amendment, namely the replacement of "comprising" by "consisting of". As explained above this is not a point of law but rather a matter of fact to be decided on the merits of the particular case. Accordingly, answering the questions submitted by the appellant would not serve to ensure a uniform application of the law. Therefore, the Board decided not to refer them to the Enlarged Board of Appeal.

2. Article 100(b) EPC

Whether or not the alloy according to claim 1 can be used to repair any Ni-based superalloy is not a matter of sufficiency of disclosure. Rather, in order to carry out the invention of claim 1, it is sufficient to realise a wire exhibiting the claimed composition. Since no obstacle can be seen in this respect, the Board concludes that the patent discloses the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

3. Inventive step

3.1 D5 relates, like the patent in suit, to a Ni alloy for repairing superalloy components. The alloy can be provided in form of a wire (page 15, lines 8 to 11) and one possible composition is disclosed in claim 27, which undisputedly represents the most relevant prior art for claim 1 of the main request.

The following table shows the composition according to present claim 1 together with the composition of the repair alloy of claim 27 of D5 (in wt%).

	Claim 1	D5 claim 27
Cr	4.75-5.25	4.75-5.25
Al	5.5-5.8	5.18-5.78
W	5.6-6.2	5.60-6.20
Ta	8.0-8.3	7.80-9.00
Mo	1.7-2.1	1.70-2.10
Co	9.5-10.5	9.50-10.50
Re	2.8-3.2	2.80-3.20
C	0.07-0.30	0.13-0.17
B	0.02-0.04	0.003-0.010
Zr	0.08-0.12	0.01-0.15
Y	0.08-0.12	0.02-0.16
Hf	1.0-1.5	0.9-1.9
Mn	≤ 0.12	≤ 0.12
Si	≤ 0.12	≤ 0.12
P	≤ 0.015	≤ 0.015
S	≤ 0.015	≤ 0.015
Fe	≤ 0.20	≤ 0.20
Cu	≤ 0.10	≤ 0.10
Ni	bal.	bal. (+ impur.)

3.2 Starting from this prior art the object underlying the claimed invention resides in the provision of a welding wire used for the weld repair of nickel-based superalloy components that exhibit strength and oxidation resistance at high temperature (paragraphs [0001] to [0003] of the patent in suit).

This object is achieved by the wire of claim 1, which has a B content lower than the repair alloy of claim 27 of D5.

3.3 Contrary to the opinion of the appellant, D5 does not render the claimed solution obvious. According to page 14, lines 6 to 16 of this document it is preferred that the alloy contain no more than about 0.010 weight % boron (i.e. the upper limit stipulated by claim 27), because larger amounts of boron depress the overall melting point of the alloy system and also result in undesirable oxidation blistering during high temperature exposure.

Therefore, an increase in B in the alloy of claim 27 to achieve the object above would be contrary to the teaching of D5, which aims at improving the oxidation resistance, not only in the case of laser-cladding but in general, and achieves this result *inter alia* by reducing the B content (see also page 6, lines 17 to 25). Accordingly, such an increase in the prior-art alloy could only be the result of hindsight.

Moreover, even if he had contemplated increasing the B content in the alloy of claim 27 of D5, the person skilled in the art would have had no reason to do so without also changing the content of other alloying elements that interact with B and also influence the properties of the Ni-alloy. Indeed, D5 discloses in table 4 a repair alloy with a B content in accordance with present claim 1 but with a higher Ta content.

Accordingly, it was not obvious to arrive at the claimed wire starting from D5. Therefore, the subject-matter of claim 1 of the main request involves an inventive step. The same conclusion applies to the subject-matter of claim 3.

## Order

### For these reasons it is decided that:

1. The appeal is dismissed.
2. The request for referral to the Enlarged Board of Appeal of the questions filed at the oral proceedings is refused.

The Registrar:

The Chairman:



V. Commare

T. Kriner

Decision electronically authenticated