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Datasheet for the decision of 12 September 2013

Case Number: T 1713/10 - 3.2.06

Application Number: 99104199.7

Publication Number: 940563

IPC: F01K23/10, F02C7/143

Language of the proceedings: EN

Title of invention:
Gas turbine combined cycle

Patent Proprietor:
MITSUBISHI HEAVY INDUSTRIES, LTD.

Opponent:
Alstom Technology Ltd

Relevant legal provisions:
EPC Art. 123(2), 84
RPBA Art. 13(1)

Keyword:
Amendments - allowable (no) main request
Late-filed auxiliary requests - request clearly allowable (no)

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Case Number: T 1713/10 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 12 September 2013

Appellant: (Opponent)	Alstom Technology Ltd CHTI-Intellectual Property Brown Boveri Strasse 7/664/2 5401 Baden (CH)
Respondent: (Patent Proprietor)	MITSUBISHI HEAVY INDUSTRIES, LTD. 5-1, Marunouchi 2-chome, Chiyoda-ku, Tokyo 100-0005 (JP)
Representative:	Henkel, Breuer & Partner Patentanwälte Maximiliansplatz 21 80333 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 25 June 2010 concerning maintenance of the European Patent No. 940563 in amended form.**

Composition of the Board:

Chairman: M. Harrison
Members: G. Kadner
W. Sekretaruk

Summary of Facts and Submissions

I. The mention of grant of European patent No. 0 940 563, on the basis of European patent application No. 99104199.7 filed on 2 March 1999, and claiming a Japanese priority of 4 March 1998, was published on 22 February 2006.

II. Notice of opposition, in which revocation of the patent on the grounds of Article 100(a) and 100(c) EPC was requested, was filed against the granted patent. With its interlocutory decision posted on 25 June 2010, the opposition division found that account being taken of the amendments made by the patent proprietor during the opposition proceedings, the patent and the invention to which it related met the requirements of the Convention.

Claim 1 of the patent, in the form found allowable by the opposition division, reads as follows (amendments with respect to claim 1 as granted underlined or ~~deleted~~):

"A gas turbine combined cycle comprising a gas turbine portion (41) ~~including~~ constituted by a low pressure compressor (2), an intermediate cooling device (42) for cooling compression air discharged from said low pressure compressor (2), a high pressure compressor (3) for further compressing the compression air from said intermediate cooling device (42) so as to generate high pressure air, a combustion device (4) for burning said high pressure air and a supplied fuel (F) and a gas turbine (5) driven by the combustion gas from said combustion device (4) so as to generate power, and

an exhaust gas heat recovery portion (46) ~~including~~ constituted by a steam generating device (11,

12, 13) for recovering heat from an exhaust gas discharged from said gas turbine (5) so as to generate steam, a steam turbine (18, 19, 20) driven by said steam generating device (11, 12, 13) so as to generate power and a condenser (22) for returning the exhaust vapor gas discharged from said steam turbine (18, 19, 20) to condensed water, wherein said condensed water circulated to said steam generating device (11, 12, 13) from said condenser (22) is branched and introduced to said intermediate cooling device (42) so as to generate steam for driving said steam turbine (18, 19, 29); characterized in that
high pressure air extracted from said high pressure compressor (3) is introduced to a rotor cooling cooler (6) for generating cooled air for cooling a high temperature portion of said gas turbine (5) and said condensed water circulated from said condenser (22) to said steam generating device (11, 12, 13) is branched and introduced to said rotor cooling cooler (6) so as to generate steam for driving said steam turbine (18, 19, 20); and
said steam turbine comprises high pressure steam turbine (18), an intermediate pressure steam turbine (19) and a low pressure steam turbine (20), and steam generated from said condensed water in said intermediate cooling device (42) and said rotor cooling cooler (6) is supplied to any one of said intermediate pressure steam turbine and said low pressure steam turbine (2)."

The opposition division held that the ground of opposition under Article 100(c) EPC was not prejudicial to maintenance of the patent and that the subject-matter claimed met the requirement of Article 123(2) EPC as well as the requirements of Articles 52 to 57 EPC.

III. Notice of appeal was filed against this decision by the appellant (opponent) on 12 August 2010, and the appeal fee was paid on the same day. The grounds of appeal were filed on 3 November 2010.

IV. With its reply to the appeal dated 8 March 2011, the respondent (patentee) requested that the appeal be dismissed.

V. In a communication accompanying the summons to oral proceedings, the Board expressed its preliminary view *inter alia* that it was questionable whether the description provided a direct and unambiguous basis for the amendments to the claim in the present form (i.e. the form found allowable by the opposition division).

VI. With letter dated 12 August 2013, the respondent filed two auxiliary requests.

VII. Oral proceedings were held on 12 September 2013, during which the respondent replaced its first auxiliary request by its former second auxiliary request, and filed a new second auxiliary request.

The appellant (opponent) requested that the decision under appeal be set aside and that the European patent No. 0 940 563 be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed, or the European patent be maintained on the basis of auxiliary request 1, filed as auxiliary request 2 with letter of 12 August 2013, or on the basis of auxiliary request 2 filed during the oral proceedings on 12 September 2013.

VIII. The claim according to auxiliary request 1 is based on claim 1 of the main request, whereby, at the end of the penultimate paragraph, the following was inserted:

"... in the same manner as the intermediate cooling device (42);"

and a comma is inserted in this paragraph after "gas turbine" in the penultimate paragraph of the claim.

Claim 1 according to auxiliary request 2 is again based on claim 1 of the main request, whereby, in the penultimate paragraph of the claim, the comma (as in claim 1 of the first auxiliary request) and the following underlined text has been inserted:

"...<u>,</u> and said condensed water circulated from said condenser (22) to said steam generating device (11, 12, 13) is branched and introduced to said rotor cooling cooler (6) <u>wherein in the exhaust gas heat recovery portion, there is provided a pressurized water pipe provided in such a manner as to branch from a condensed water supply pipe for supplying the condensed water to the steam-generating device from the condenser and interposing a pressurizing pump for supplying the condensed water to the rotor cooling cooler (6),</u> so as to generate steam for driving said steam turbine (18, 19, 20);"

IX. The arguments of the appellant can be summarized as follows:

The patent in the form found allowable by the opposition division contravened Article 100(c) EPC. Neither in the claims as originally filed nor in the description was it disclosed what happened with that

part of the condensed water circulated from the condenser 22 to the steam generating device 11, 12, 13 and the intermediate cooling device 42 which was branched. No disclosure at all was present as to how this branched condensed water should be introduced to the rotor cooling cooler 6. Also the disclosure in paragraph [0058] of the A-publication in this regard was not clear and unambiguous because the wording "in the same manner as the intermediate cooling device 42" left various possibilities open to the skilled person.

The first and second auxiliary requests should not be admitted into the proceedings since they did not overcome the objections made in respect of the main request. The insertion made in the claim by means of auxiliary request 1 caused a lack of clarity because it did not define in any way how steam was generated in the rotor cooling cooler "in the same manner" as in the intermediate cooling cooler 42. For this to occur "in the same manner" was certainly not even technically realistic since the temperature levels in the different coolers differed from one another.

The amendment of the claim by way of auxiliary request 2 using a feature taken from the description at such a late stage of proceedings should not be allowed. What was disclosed in paragraph [0039] anyway related only to supplying condensed water by a pressurizing pump to the intermediate cooling cooler 42. No clear link was present between paragraph [0039] and the disclosure in paragraph [0058] where rotor cooling cooler 6 was mentioned. Thus, at the very least, the introduced feature had been isolated out of the context in which it was disclosed, contrary to Article 123(2) EPC.

X. The respondent argued in respect of the main request that, although not shown in the drawing, it was implicitly disclosed that the branched water was transferred to the rotor cooling cooler 6. A clear disclosure was given by the description in paragraph [0058] from which the skilled person would clearly derive that, by analogy, the supply or introduction to the rotor cooling cooler 6 was made in the same manner as the introduction to the intermediate cooling device 42. The skilled person would clearly understand that the condensed water according to the teaching of the patent in suit had somehow to be introduced to the rotor cooling cooler 6. Moreover, the amendments in the claim were not open to objection, since the identical wording of originally filed claims 2 and 3 had been used. Thus claim 1 met the requirement of Article 123(2) EPC.

The amendments to the claim of auxiliary request 1 had been made for additional clarification. By the insertion of a comma the different features had been properly separated, and the passage "in the same manner as the intermediate cooling device 42" was related to the feature "intermediate cooling device 42" which was already present in the first part of the preamble of the claim. Thus it was clarified how "the same manner" of introducing the branched condensed water to the rotor cooling cooler 6 should be understood.

In the claim of auxiliary request 2, the wording "the same manner" was more precisely defined by adopting the relevant disclosure of paragraph [0039], where the supply of a branch of condensed water from the condenser to the intermediate cooling device 42 was described in detail. The skilled person reading "in the same manner" in paragraph [0058] would clearly

recognize that the intention was similar in respect of the introduction to the rotor cooling cooler 6. By that amendment, the gap in the supply of branched condensed water to the rotor cooling cooler 6 for generating steam for driving the steam turbine, to which objection had been raised, was now closed. The claim was therefore clear.

Reasons for the Decision

1. The appeal is admissible.

2. *Main request (Article 100(c), 123(2) EPC)*

2.1 In respect of the original disclosure of the amendments, the respondent relied on claim 1 and certain passages of the application as originally filed in combination with claims 2 and 3. Claim 2 as filed includes the wording: "said condensed water ... is branched," as well as "and a high pressure air extracted from said high pressure compressor is introduced to a rotor cooling cooler (6)..., thereby generating a steam for driving said steam turbine (18,19,20)".

2.2 In claim 1 of the main request, however, the order of the terms "condensed water" and "high pressure air" has been changed. The terminology "and introduced to said rotor cooling cooler (6) so as to generate steam for driving said steam turbine (18,19,20)" related before to the "high pressure air" was newly added to the term "said condensed water ... is branched". The relation of what causes the generation of steam was thereby changed when compared to claim 2 as filed. Claim 3 as filed, although it refers to steam generated, does not provide

a basis for the adaptation of the wording from claim 2 which is used in claim 1. This amendment therefore does not comply with Article 123(2) EPC since the subject-matter claimed was not originally disclosed.

2.3 The respondent's argument that the amendment was based on the wording as used in the originally filed claims cannot be followed because, although certain of the same words are used, the relationship between the high pressure air and the condensed water generating steam for driving the steam turbine has been changed leading to a different technical effect.

2.4 Although the respondent further cited paragraph [0058] as providing an implicit disclosure of the features as defined in claim 1, due to the wording "the same manner" used therein, paragraph [0058] does not unambiguously specify the disputed features defined in claim 1. Paragraph [0058] instead merely describes, with reference to a shown embodiment in which "the cooled heat recovered in the rotor cooling cooler 6 is discharged to the ambient air by the cooling tower", that, in a similar manner to the intermediate cooling device 42, the structure can be made "such that an apparatus for generating a steam from the condensed water comprising the economizer, the evaporator and the superheater is provided so as to recover the cooled heat obtained when making the extracted steam the cooled air." This disclosure nowhere discloses, in the manner claimed, that condensed water from condenser 22 is (simply) branched and introduced to the rotor cooling cooler 6 to generate steam. How the cooled heat is recovered to make cooled air from the extracted steam is certainly not directly and unambiguously derivable.

The main request is therefore not allowable.

3. *Auxiliary requests (Article 13(1) RPBA)*

3.1 According to Article 13(1) of the Rules of Procedure of the Boards of Appeal (RPBA) any amendment to a party's case after it has filed its grounds of appeal may be admitted and considered at the Board's discretion. The discretion has to be exercised in view of inter alia the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy. In order to meet the need for procedural economy at such a late stage an amended request should be *prima facie* allowable.

3.2 First auxiliary request (Article 84 EPC 1973)

3.2.1 Claim 1 according to this request was amended by the insertion of a feature "in the same manner as the intermediate cooling device (42)" taken from the description (paragraph [0058]) reading:

"That is, in Fig. 1 there is shown the embodiment in which the cooled heat recovered in the rotor cooling cooler 6 is discharged to the ambient air by the cooling tower 7, however, in the same manner as the intermediate cooling device 42 mentioned above, the structure can be made such that an apparatus for generating a steam from the condensed water comprising the economizer, the evaporator and the super heater is provided so as to recover the cooled heat obtained when making the extracted steam the cooled air."

3.2.2 The respondent argued that the skilled person having general knowledge in this technical field would have sufficient information how to apply this teaching in

the device shown in Fig. 1 for generating steam for driving the steam turbine. However, the Board finds that the added feature does not meet the requirement of clarity since any teaching is lacking concerning how to supply or introduce the branch of condensed water to the rotor cooling cooler. Such a rotor cooling cooler 6 has a technically different construction and function to the intermediate cooler 8, and not least by omitting to define that the "same manner" of application requires an economizer, an evaporator and a super heater, leaves it anyway simply unclear by which means the branched water is introduced to the rotor cooling cooler.

3.2.3 Furthermore, as asserted by the appellant, the temperature of the compression air discharged from the low pressure compressor 2 has a temperature of 190°C or more and is, in the intermediate cooler 8, cooled down to about 100°C whereas the part of high pressure air discharged from the high pressure compressor 3 for cooling the rotor blades of the gas turbine 5 after cooling down in the rotor cooling cooler 6 has a temperature of about 200°C. The temperature when discharged from the high pressure compressor 3 is not indicated. No clear teaching can be derived concerning how to perform the generation of steam "in the same manner" at such differing temperature levels.

Lack of clarity of the claim and also its effect on consideration of Article 123(2) EPC led the Board to the conclusion that the amended request appeared at least *prima facie* not to be allowable. Therefore the Board exercised its discretion not to admit this request into the proceedings.

3.3 Second auxiliary request

3.3.1 The respondent stated that the purpose of filing this request was to overcome the deficiency in the claim of the previous request.

According to the respondent, the amended features are based on the description (paragraph [0039]). The deviations of the used wording from the original text are underlined or ~~deleted~~:

"~~Further,~~ in the exhaust gas heat recovery portion ~~46~~, there is provided a pressurized water pipe ~~47~~ provided in such a manner as to branch from a ~~the~~ condensed water supply pipe ~~25~~ for supplying the condensed water to ~~each of~~ the steam-generating device~~s 11, 12 and13 mentioned above~~ from the condenser ~~22~~ and interposing a pressurizing pump ~~48~~ for supplying the condensed water to the ~~intermediate cooling device 42~~ rotor cooling cooler (6), ..."

3.3.2 In accordance with the preceding paragraph (i.e. paragraph [0038]) this part of the description refers to the supply of two branches of branched condensed water to the exhaust gas heat recovery portion 46 on the one hand and to the intermediate cooling device 42 on the other hand. No indication or any interrelation can be found between paragraphs [0039] and [0058], each of which refer to specific embodiments. In particular, there is no basis for the replacement of "intermediate cooling device 42" by "rotor cooling cooler (6)" because the rotor cooling cooler 6 does not play any role in this part of the description. The combination of certain features disclosed in paragraph [0039] and paragraph [0058] thus results in subject-matter which, at least *prima facie*, contravenes Article 123(2) EPC.

Therefore the Board exercised its discretion not to admit this request into the proceedings.

4. Since the respondent's requests were either not allowable or not admitted into the proceedings, the patent has to be revoked.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The European patent is revoked.

The Registrar: The Chairman:

M. H. A. Patin M. Harrison

Decision electronically authenticated