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Datasheet for the decision of 22 January 2008

Case Number: T 0248/04 - 3.5.02

Application Number: 99303479.2

Publication Number: 0942521

IPC: H02P 1/46

Language of the proceedings: EN

Title of invention:
Engine starting systems and methods

Applicant:
SUNDSTRAND CORPORATION

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 76(1)

Relevant legal provisions (EPC 1973):
EPC Art. 76(1)

Keyword:
"Main, first and second auxiliary requests - extension beyond the content of the earlier application - (yes)"
"Third auxiliary request - allowable - (yes)"

Decisions cited:
-

Catchword:
The reasons points 2 to 2.2.

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0248/04 - 3.5.02

D E C I S I O N
of the Technical Board of Appeal 3.5.02
of 22 January 2008

Appellant: SUNDSTRAND CORPORATION
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 19 September 2003 refusing European application No. 99303479.2 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: M. Rognoni
Members: J.-M. Cannard
P. Mühlens

Summary of Facts and Submissions

I. The appellant contests the decision of the examining division to refuse European patent application No. 99 303 479.2.

II. The relevant history of the case before the first instance may be summarized as follows:

The present application is a divisional application based on the earlier European patent application No. 94 917 289.4.

Oral proceedings were held before the examining division on 6 February 2002, at which the examining division announced that the main request submitted during the oral proceedings was not allowable and it intended to grant a European patent on the basis of claims 1 to 9 according to an auxiliary request filed with the letter of 10 March 2000, with the description, pages 1 to 3, 13 to 122 and the drawings, sheets 1/45 to 45/45, both as originally filed.

A communication under Rule 51(4) EPC was issued on 5 March 2002, informing the applicant of the text in which it intended to grant the patent. The indicated text was in substance the same as that of said auxiliary request.

With letters dated 11 December 2002 and 8 July 2003, the applicant stated that he did not accept the text submitted with the communication under Rule 51(4) EPC, that he maintained his main request and requested a

formal decision refusing the grant of a patent based on the main request.

According to the decision dated 19 September 2003, the reasons given for the refusal were that the subject-matter of claim 1 according to the main request could not be directly and unambiguously derived from the earlier application and thus violated Article 76(1) EPC.

III. Claim 1 according to the present main request, which corresponds to claim 1 refused by the examining division, reads as follows:

"A method of controlling the start-up and ignition of a prime mover such as a gas turbine engine in which the prime mover is coupled to a starter motor which provides motive power to the prime mover to accelerate the prime mover up to self-sustaining speed, which method comprises the steps of:

(a) during a first phase prior to ignition of the prime mover, causing the starter motor to provide motive power to the prime mover so as to accelerate the prime mover at a first predetermined rate;

(b) during a second phase subsequent to the first phase, causing the starter motor to provide motive power to the prime mover so as to accelerate the prime mover at a second predetermined rate which is less than the first predetermined rate; and

(c) during the second phase, providing fuel to the prime mover to facilitate ignition of the prime mover."

IV. During the oral proceedings held on 22 January 2008 before the Board of appeal, the appellant filed claims by way of five auxiliary requests. The fourth and fifth auxiliary requests, however, are not relevant to the present decision.

Claim 1 according to the first auxiliary request differs from claim 1 of the main request in that the expressions "first predetermined rate" and "second predetermined rate" are amended to "first specific predetermined rate" and "second specific predetermined rate", respectively.

Claim 1 according to the second auxiliary request differs from claim 1 of the first auxiliary request in that the "second specific predetermined rate which is less than the first specific predetermined rate" is amended to "a second specific predetermined rate that is greater than zero but less than the first specific predetermined rate".

Claim 1 of the third auxiliary request is based on claim 1 of the auxiliary request according the communication under Rule 51(4) EPC issued by the examining division and reads as follows:

"A method of controlling the start-up, ignition and subsequent acceleration of a prime mover such as a gas turbine engine in which the prime mover is coupled to a starter motor which provides motive power to the prime mover to accelerate the prime mover up to self-sustaining speed, which method comprises the steps of:

(a) during a first phase prior to ignition of the prime mover, causing the starter motor to provide motive power to the prime mover so as to accelerate the prime mover at a first predetermined rate;

(b) during a second phase subsequent to the first phase, causing the starter motor to provide motive power to the prime mover so as to accelerate the prime mover at a second predetermined rate which is less than the first predetermined rate;

(c) during the second phase, providing fuel to the prime mover to facilitate ignition of the prime mover; and

(d) during a third phase subsequent to the ignition of the prime mover, causing the starter motor to provide motive power to the prime mover so as to accelerate the prime mover at a third predetermined rate."

Claims 2 to 9 of the third auxiliary request are dependent on claim 1.

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

The earlier application and the divisional application both identified the invention as relating to starting systems and methods. The start-up or starting method of the invention was to be regarded as concluded when the gas turbine engine reached self-sustaining speed, that is to say, the speed at which the engine would continue to operate even if the electrical motor power to the turbine were discontinued. The invention in its broadest concept related exclusively to a start-up method which

terminated when the engine reached self-sustaining speed. The Summary of the Invention in the earlier application (see the paragraph bridging pages 12 and 13 of the corresponding published application) identified in a first sentence a method of bringing a prime mover up to self-sustaining speed having a first and a second phase, and in a second sentence an optional third phase. The statement in the Summary of the Invention, page 3 of the divisional application, was fully consistent with the original disclosure of the earlier application when it identified in a single sentence a method of controllably starting and igniting a prime mover as a gas turbine engine which comprised a first phase and a second phase, and discussed in a second sentence a third optional phase subsequent to the ignition of the prime mover. The gas turbine engine thus could reach its self-sustaining speed, thereby terminating the start-up, at the end of the second phase. The first and second phases were required to achieve reliable ignition, which was the primary purpose of the invention. The third phase, though desirable, was optional and had quite a different purpose, i.e. the prevention of loss of ignition due to excessive acceleration. Claim 17 of the earlier application, in which the starting system was defined in terms of three phases, was more limited than the broadest disclosure of the invention in the earlier application. It was clear from the preferred embodiment described with reference to figure 4 that the third phase did not end when the engine had reached its self-sustaining speed and the starting sequence was complete because power to the generator was cut off some time after the attainment of the self-sustaining speed (see application, page 36, lines 16 to 19). In the result,

claim 1 of the main request did not contravene Article 76(1) EPC.

VI. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request attached to the decision under appeal or on the basis of one of the auxiliary requests 1 to 3 filed in the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.

Main and first and second auxiliary requests

2. Claim 1 of the main request relates to a method of controlling the start-up and ignition of a prime mover up to self-sustaining speed which comprises two phases of acceleration, i.e. a first phase prior to ignition of the prime mover and a second phase subsequent to the first phase, during which fuel is provided to the prime mover to facilitate ignition of the prime mover. The method according to claim 1 is not directly and unambiguously derivable from the originally filed earlier application and contravenes Article 76(1) EPC.

2.1 It is beyond dispute that the invention described in the earlier application as originally filed identifies a starting method to accelerate the prime mover up to self-sustaining speed (statement of grounds of appeal, point 6). Such a method is performed for instance by the control system according to claim 17 of the originally filed earlier application, or described in the

embodiments of the invention identified in the "Summary of the invention" of said earlier application (pages 10 to 13 of application as published WO94/27359). The preferred starting method of the invention described in the earlier application as filed comprises a first initial phase and "The initial acceleration phase begins upon commencement of start-up of the prime mover" (page 34, lines 11 and 12 of the published application). The paragraph bridging pages 112 and 113 of the earlier application identifies the prime mover's self-sustaining speed as the speed "at which time start-up of the prime mover 21 has been accomplished". Accordingly, the method of controlling the start-up and ignition of a prime mover according the present main request and the starting method described in the earlier application both relate to a starting method for controlling the acceleration of a prime mover up to self-sustaining speed.

2.2 It is not disputed that a starting system control which is defined in terms of three phases, namely the first and second phases identified above and a third phase subsequent to the ignition of the prime mover, is disclosed in the earlier application as originally filed, for instance in claim 17 (statement of grounds, point 11). However, according to the appellant, the originally filed earlier application in its broadest concept related to a starting method comprising only the first and second phases. The Board cannot share this view.

2.3 The originally filed earlier application specifies (paragraph bridging pages 12 and 13 of the application as published): "Also in accordance with any of the embodiments, the control includes means for igniting a

prime mover and the electromagnetic machine is operated to bring the prime mover up to self-sustaining speed and further includes first means operable during a first phase prior to ignition..., second means operable during a second phase subsequent to the first phase...to facilitate ignition thereof. Third means are operable during a third phase subsequent to the ignition of the prime mover...at a third predetermined rate." (emphasis added). According to the appellant, the first sentence of this paragraph showed that the self-sustaining speed was necessarily reached at the end of the second phase and that the third means and phase identified in the second sentence were an optional feature of the invention. If the appellant's views were correct, the prime mover should reach the self-sustaining speed, that is to say the speed at which the engine would continue to operate even if the electrical motor power to the turbine was discontinued, at the end of the second phase in any of the embodiments of the invention. However, this is not the case in at least the preferred starting method of the invention (earlier application as published, pages 34 to 37). According to said embodiment described with reference to figure 4, upon ignition, i.e. upon the end of the second or ignition phase, a torque augmentation phase begins at a point designated 182 and the amount of torque provided by the prime mover increases while the amount of torque provided by the generator decreases to a very low level. This indicates that self-sustaining speed is reached somewhere after the point 182, i.e. during in the third phase. Moreover, according to claim 17, a motoring mode which comprises three phases of acceleration brings the prime mover up to a self-sustaining speed. Therefore, all the starting methods for accelerating a prime mover up to a self-

sustaining speed which are described in the originally filed earlier application do comprise three phases of acceleration.

2.4 It follows from the foregoing that a third phase of acceleration subsequent to the ignition of the prime mover is necessary to achieve the purpose of the invention, i.e. accelerating a prime mover up to self-sustaining speed. Consequently, it is not directly and unambiguously derivable from the original application that such a third phase could be omitted in the starting method described in the earlier application. The method of controlling the start-up and ignition of a prime mover of the divisional application according to claim 1 of the main request, which does not comprise such a third phase, is not directly and unambiguously derivable from the earlier application as originally filed and contravenes Article 76(1) EPC. A patent thus cannot be granted on the basis of the appellant's main request.

3. It follows from the previous considerations that also independent claims 1 of the first and second auxiliary requests, which only identify a first and a second phase to accelerate the prime mover at first and second specific predetermined rates, contravene Article 76(1) EPC.

Third auxiliary request

4. Claim 1 according to the third auxiliary request does not differ in substance from claim 1 according to the auxiliary request on the basis of which the examining division intended to grant a patent. The text of the description and the drawings are in substance the same

as those mentioned in the communication under Rule 51(4) EPC issued by the examining division, except for an acknowledgement of the closest prior art document WO90/06011. It is clear from the communication under Rule 51(4) EPC that the examining division considered that the application according to said auxiliary request met the requirements the EPC. The Board sees no reason to disagree with the examining division in this respect.

5. In the result the Board finds that the application amended according to the third auxiliary request meets the requirements of the EPC and that a patent can be granted on the basis thereof.

Order

For these reasons it is decided that :

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a patent on the basis of:

   claims: 1 to 9 of the third auxiliary request filed in the oral proceedings;

   description: pages 1 to 122 filed in the oral proceedings;

   drawings: figures 1A to 50 filed in the oral proceedings.

The Registrar: The Chairman:

U. Bultmann M. Rognoni