

Internal distribution code:

- (A) Publication in OJ
(B) To Chairmen and Members
(C) To Chairmen
(D) No distribution

**Datasheet for the decision
of 16 July 2009**

Case Number: T 1872/07 - 3.2.08

Application Number: 04250740.0

Publication Number: 1449928

IPC: C22C 1/04

Language of the proceedings: EN

Title of invention:

Method for fabricating a superalloy article without any melting

Applicant:

GENERAL ELECTRIC COMPANY

Headword:

-

Relevant legal provisions:

EPC Art. 54

Keyword:

"Novelty - (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 1872/07 - 3.2.08

D E C I S I O N
of the Technical Board of Appeal 3.2.08
of 16 July 2009

Appellant: GENERAL ELECTRIC COMPANY
1 River Road
Schenectady, NY 12345 (US)

Representative: Pedder, James Cuthbert
London Patent Corporation,
General Electric International, Inc.
15 John Adam Street
London WC2N 6LU (GB)

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 27 June 2007
refusing European patent application
No. 04250740.0 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: T. Kriner
Members: R. Ries
E. Dufrasne

Summary of Facts and Submissions

I. European patent application EP-A-1 449 928 concerns a method for fabricating a superalloy article without any melting.

II. In its decision posted on 27 June 2007, the examining division reasoned that the subject matter of claim 1 then on file lacked novelty (Article 54 EPC) and therefore decided to refuse the application.

In reaching its decision the examining division took inter alia the following document into account:

D2: US-A-4 894 086

III. The appellant (applicant) filed a notice of appeal which was received at the European Patent Office on 7 September 2007 and paid the appeal fee on the same date. The statement setting out the grounds of appeal was received on 7 November 2007.

IV. Oral proceedings were held on 16 July 2008.

The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of claims 1 to 9 of the primary request submitted at the oral proceedings.

V. The wording of claim 1 of this request is as follows:

"1. A method for fabricating a metallic article (20) made of metallic constituent elements, comprising the steps of

consolidating a metallic superalloy material to produce a consolidated metallic article (20), without melting the metallic superalloy material and without melting the consolidated metallic article (20) such that the metallic superalloy material is never heated above its melting point and is not macroscopically or grossly melted, such that it would liquify and lose its shape, wherein the metallic superalloy material is produced by the steps of:

furnishing a mixture of nonmetallic precursor compounds of the metallic constituent elements; and
chemically reducing the mixture of nonmetallic precursor compounds to produce the metallic superalloy material; the method characterized by the step of:
heat treating the consolidated article (20) ."

VI. The appellant's arguments can be summarized as follows:

Document D2 related to a method of producing dispersion hardened metal alloys. The document did, however, not include a clear and unambiguous indication of a step in which the chemical reduction of a mixture of non-metallic precursor compounds to produce a metallic superalloy material was provided. Moreover, the known process resulted in powder material rather than a metallic article that was fabricated according to the claimed process. Thus the process disclosed in document D2 did not comprise a compacting step and, in addition thereto, did not necessarily deal with a superalloy material. Furthermore, there was no clear teaching in D2 the non-metallic material was never heated above its melting point so that it was never macroscopically melted.

Hence, the claimed process set out in amended claim 1 was novel with respect to the process known from D2.

Reasons for the Decision

1. The appeal is admissible.
2. Novelty

Document D2 is concerned with a method of producing dispersion hardened metal alloys for structural parts of complicated shapes which are resistant to high temperatures, such as turbine blades, and in which particles of a second phase are integrated into a metallic matrix (see D2, column 1, lines 5 to 10). According to the known method, the starting material (i.e. the non-metallic precursor compounds) comprises a solution of one or more metal salts or mixtures of salts of reducible metals and, as the second phase, powder particles of metals and their alloys whose salts and oxides cannot be subjected directly to a reduction process (see D2, column 1, lines 46 to 50; column 2, lines 2 to 4 and lines 35 to 47).

After spraying, drying and reducing this mixture (i.e. the colloidal solution or slip), a metal powder material comprising non-reactive dispersants is obtained (see D2, column 2, lines 8 to 10 and column 3, lines 14 to 19). The metal powder can be worked by known methods of powder metallurgy to form compact bodies of desired shape, for instance by extrusion, extrusion moulding, sintering, cold isostatic pressing

or hot isostatic pressing (see D2, column 3, lines 20 to 32).

By affecting a heat treatment step according to a particular time-temperature program before or after the compacting of the metal powder to form a shaped alloy article, the metal particles can be uniformly diffused into the matrix, even if they are oxidised on their surface (see D2, column 1, lines 63 to 68; claims 1, 10, 11, 13).

3. The appellant argued that the process known from D2 failed to disclose clearly and unambiguously a "chemical reduction" of the precursor materials and did not deal with superalloy materials. He further held the view that the known process did not include a step for compacting the metal powder into a shaped article and failed to disclose that the supermetallic material was never heated above its melting point.

The Board cannot follow this reasoning. As set out in the example of D2, column 2, lines 35 to 62, a nickel-chromium alloy is dissolved in hydrochloric acid (HCl) to form a (chloride) salt solution which is used a starting material. Likewise, the precursor compounds in the claimed process are preferably metal halides, i.e. metal salts such as chlorides (see the application page 9, last paragraph, penultimate sentence). From the overall disclosure of document D2 it is beyond doubt that the metal salts are chemically reduced in a reaction chamber to form a metallic powder without melting the powder at any time (see for instance D2, column 2, lines 8, 9; column 3, lines 14 to 19; claim 13).

Moreover, the example given in document D2, column 2, lines 55 to 59 specifically refers to the preparation of superalloy powders. The compacting step which typically comprises extrusion, sintering, cold isostatic pressing or even hot isostatic pressing to form shaped bodies from the powder is clearly and unambiguously disclosed in D2, column 3, lines 21 to 32 and in claims 10 and 11 and does not involve heating the article above the melting point of the powder so that it is macroscopically or grossly melted and loses its shape.

In conclusion, the method set out in claim 1 of the application is anticipated by the disclosure of document D2. The subject matter of claim 1 therefore lacks novelty.

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

V. Commare

T. Kriner