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**Datasheet for the decision
of 17 December 2009**

Case Number: T 0693/07 - 3.2.08

Application Number: 02705845.2

Publication Number: 1356128

IPC: C21D 9/00

Language of the proceedings: EN

Title of invention:
Integrated metal processing facility

Applicant:
Consolidated Engineering Company, Inc.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 123(2)

Relevant legal provisions (EPC 1973):
EPC Art. 84, 111

Keyword:
"Clarity (yes, after amendment)"
"Added subject-matter (no)"
"Remittal"

Decisions cited:
-

Catchword:
-



Case Number: T 0693/07 - 3.2.08

D E C I S I O N
of the Technical Board of Appeal 3.2.08
of 17 December 2009

Appellant:
(Applicant)

Consolidated Engineering Company, Inc.
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Representative:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 28 November 2006
refusing European patent application
No. 02705845.2 pursuant to Article 97(1) EPC
(1973).

Composition of the Board:

Chairman: T. Kriner
Members: M. Alvazzi Delfrate
U. Tronser

Summary of Facts and Submissions

- I. The appellant lodged an appeal against the decision of the examining division, posted on 28 November 2006, to refuse the European patent application No. 02705845.2. The notice of appeal was filed on 26 January 2007 and the appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on 27 March 2007.
- II. In the appealed decision the examining division held that the main request and the first to fourth auxiliary requests lacked clarity, since the definition of the "process control temperature" was unclear, and that the fifth auxiliary request contravened Article 123(2) EPC (1973), since the deletion from claim 1 of the essential meaning of the process control temperature added new matter to the content of the application as originally filed.
- III. Oral proceedings before the board of appeal were held on 17 December 2009 at the end of which the appellant requested that:
- the decision under appeal be set aside and
 - a patent be granted on the basis of the main request, or the auxiliary request 1 or 2, all filed with the letter dated 26 January 2007, or on the basis of auxiliary request 3 or 5 filed with the letter dated 5 November 2009, or on the basis of auxiliary request 4 or 6 filed at the oral proceedings.

IV. Independent claim 5 of the main request reads as follows (emphasis added):

"A method of forming and treating a metal casting (12), comprising: pouring a molten metal into a mold (10); allowing the molten metal within the mold (10) to cool to a temperature sufficient to enable the molten metal to solidify to form the casting (12); transferring the molds (10) with the castings (12) therewithin or the castings (12) without the molds (10) to a heat treatment station (26, 42, 92, 103); arresting the cooling of the casting (12) and maintaining the casting (12) at or above a **process control temperature** for the metal of the casting (12) but below a heat treatment temperature thereof as the casting (12) is moved into a heat treatment station (26, 42, 92, 103) of a heat treatment unit, wherein **the process control temperature is a predetermined temperature below which for every one minute of time the casting decreases in temperature, more than one minute, and up to approximately four minutes, of additional heat treatment time is required to attain the desired properties of the casting (12);** and heat treating the casting (12)."

V. Independent claim 2 of auxiliary request 1 differs from claim 5 of the main request among other things by the following definition of the process control temperature:

"... the process control temperature is a temperature below which for every one minute of time the temperature of the casting (12) decreases, more than one minute and up to approximately four minutes of

additional heat treatment time is required to attain the desired properties of the casting (12);".

- VI. Independent claim 4 of auxiliary request 2 differs from claim 5 of the main request among other things by the following definition of the process control temperature:

"... the process control temperature is a temperature whereby substantial solidification of the metal of the casting (12) is facilitated while enabling rapid reheating of the casting to the solution heat treatment temperature, and below which for every one minute of time the temperature of the casting (12) decreases, more than one minute of heat treatment is required to attain the desired properties of the casting (12), and wherein the process control temperature is less than the solution heat treatment temperature."

- VII. Independent claim 1 of the auxiliary requests 3 and 5 defines the process control temperature as follows:

"... the process control temperature is defined as the temperature below which, for every one minute of time the temperature of the castings (12) would decrease if exposed to the ambient temperature, more than 4 minutes or more of additional heat treatment would be required to both heat the castings (12) back up to the desired heat treatment temperature and hold the castings (12) at said heat treatment temperature for heat treating the castings (12) to achieve the desired physical properties thereof."

VIII. Independent claim 1 of the auxiliary requests 4 and 6 reads as follows:

"A method of forming and heat treating a plurality of metal castings (12) consisting of an aluminium/copper alloy or an iron alloy comprising:
pouring a molten metal into a plurality of molds (10) to form a plurality of individual castings (12), the geometry of the molds (10) defining the geometry of the heat treated castings (12);
transferring the castings (12) to a heat treatment station (26, 42) while maintaining the geometry and enabling the castings (12) to solidify;
heat treating the castings (12) at a desired heat treatment temperature; and,
between the steps of pouring the molten metal or metal alloy and heat treating the castings (12), permitting the castings (12) to cool to an extent sufficient to enable the metal to solidify while continuously maintaining the castings (12) at or above a process control temperature,
wherein, if the metal is an aluminium/copper alloy the process control temperature is from 400°C to 470°C or
wherein, if the metal is an iron alloy the process control temperature is from 1000°C to 1300°C."

The auxiliary request 4 additionally comprises independent claim 12 reading as follows:

"An integrated metal processing facility for forming and heat treating metal castings consisting of an aluminium/copper alloy or an iron alloy(12), comprising:

a pouring station (11) for pouring a molten metal into a series of molds (10) to form the castings (12); a transfer system (27) for moving the castings (12) from said pouring station (11) to a heat treatment unit (26), said heat treatment unit (26) including: at least one heat treatment station (42) for heat treating the castings (12) at a desired heat treatment temperature; and a process temperature control station (36) comprising a heat source (33) positioned along a path of travel for the castings (12) to create a heated environment within the process temperature control station (36), the amount of heat to be applied being controllable such that the cooling of the castings (12) received within the process temperature control station (36) is arrestable: below a temperature permitting the castings (12) to cool to an extent sufficient to enable the metal to solidify; and at or above a process control temperature until the castings (12) are introduced into said heat treatment station (42), wherein the process control temperature is from 400°C to 470°C if the metal is an aluminium/copper alloy or wherein the process control temperature is from 1000°C to 1300°C if the metal is an iron alloy."

IX. The auxiliary request 6 corresponds to auxiliary request 4 with the omission of the independent claim 12 and its dependent claims 13 and 14.

X. In support of its submissions the appellant referred to the following documents:

D4: Declaration of Dr. Ruel A. Overfelt;

- D5: Copies from Metalcaster's Reference Guide, page 349 and Transport Phenomena in Materials Processing page 432;
- D6: "Metallkunde für das Maschinenwesen"; K.G. Schmitt-Thomas, Vol. II (1989) pages 14-15, 20-23, 26-27, and 90-91.

XI. The appellant argued that the definition of the process control temperature given in the independent method claims of the main request and the auxiliary requests 1 to 3 and 5 was clear. The person skilled in the art was aware that metal and alloys were not ideal bodies and that their cooling or heating involved a variety of complex phenomena, some of them being described in D6. Therefore, the process control temperature had to be determined individually for each specific alloy. However, this determination could be easily carried out by one of ordinary skill in the art, as stated in D4, point 11, in particular in the light of the knowledge of the solution heat treatments generally adopted, such as those described in D5, page 349, and of the laws of diffusion. Therefore, the independent method claims of the main request and the auxiliary requests 1 to 3 and 5 were clear.

The use of the process control temperature for partially defining the device claimed in the auxiliary request 4 did not result in a lack of clarity, since said feature was merely a functional definition of the characteristics of the claimed facility. Therefore, also claim 12 of the auxiliary request 4 was clear.

Reasons for the Decision

1. The appeal is admissible
2. According to claim 5 of the main request the process control temperature is a predetermined temperature below which for every one minute of time the casting decreases in temperature a given amount of additional heat treatment time is required to attain the desired properties of the casting.

It is true, in accordance with what is stated in D4, point 5, that the application in suit teaches that the process control temperature is a lower temperature limit established to minimize the negative effects on subsequent solution heat treatment times due to the excessive cooling of the casting after solidification processing. However, this teaching alone is not enough for concretely determining the process control temperature. It is apparent to the person skilled in the art that the process control temperature does not only depend on the specific alloy, as correctly argued by the applicant, but also on the form of the sand mould and of the casting, its desired properties, the heat treatment temperature, the rate of heating to the heat treatment temperature, the rate of cooling and the degree of undercooling from the process control temperature.

Since neither claim 5 nor the description specify said variables, the reader is left in the dark as to how to determine the process control temperature in practice. D4, which merely states that this determination could be easily carried out by one of ordinary skill in the

art (see point 11), without concretely explaining how this could be done in the light of his common general knowledge and of the information provided by the application in suit, fails to convince the board of the contrary .

Therefore, claim 5 of the main request lacks clarity and does not meet the requirements of Article 84 EPC (1973).

3. For the same reason the definition of the process control temperature according to claim 2 of auxiliary requests 1, claim 4 of auxiliary request 2, claim 1 of auxiliary requests 3 and 5 lacks clarity.

Therefore, said claims do not meet the requirements of Article 84 EPC (1973) too.

4. Claim 12 of auxiliary request 4 is directed to an integrated metal processing facility, which is partly defined by a feature relating to its functioning, namely the process control temperature to be adopted as function of the castings material.

One of the requirements for permitting a functional feature defining a technical result in a claim is that this feature provides instructions sufficiently clear for the expert to reduce it to practice without undue burden. This requirement is not complied with in the present case, since it is completely unclear which limitations on the claimed device, if any, are defined by said feature.

Accordingly, also claim 12 of auxiliary request 4 lacks clarity and does not meet the requirements of Article 84 EPC (1973).

5. Auxiliary request 6.

5.1 Claim 1 of auxiliary request 6 is based on the originally filed claim 1, being redrafted as a method claim and restricted to the treatment of aluminium/copper or iron alloys, wherein the process control temperature for these alloys falls within the numerical ranges disclosed in the description as filed at page 11, last paragraph. Accordingly, said restrictions do not add subject-matter extending beyond the content of the application as filed. Moreover, since the features of originally filed claim 1 are all present in present claim 1, no subject-matter has been added by deletion of a feature either. Therefore, the amended claim 1 complies with Article 123(2) EPC.

5.2 The process control temperature has been defined in a broad, but nevertheless clear way by means of numerical ranges. Since also the remaining features of claim 1 of the auxiliary request 6 are clear, the claim meets the requirements of Article 84 EPC (1973).

6. While the main request and auxiliary requests 1 to 5 are not allowable for the reasons given above, auxiliary request 6 succeeds in removing the grounds underlying the appealed decision, i.e. lack of clarity and contravention of Article 123(2) EPC.

Since no decision was taken by the examining division on the issues of novelty and inventive step, the board

finds it appropriate to remit the case to the department of the first instance for further prosecution on the basis of this request.

Order

For these reasons it is decided that:

The decision under appeal is set aside.

The case is remitted to the department of the first instance for further prosecution on the basis of claims 1 to 11 of the 6th auxiliary request submitted at the oral proceedings.

The Registrar:

The Chairman:

V. Commare

T. Kriner