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D E C I S I O N
of 8 June 2004

Case Number: T 1062/03 - 3.2.3

Application Number: 00953275.5

Publication Number: WO-A1-01/10584

IPC: B22D 35/04, B22D 41/50,
C22B 21/06

Language of the proceedings: EN

Title of invention:
Distributor device for use in metal casting

Applicant:
Pyrotek Engineering Materials Limited

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56, 82

Keyword:
"Unity - (yes)"
"Inventive step - main request, first and second auxiliary
request (no), third auxiliary request (yes)"

Decisions cited:
-

Catchword:
-



Case Number: T 1062/03 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 8 June 2004

Appellant: Pyrotek Engineering Materials Limited
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Representative: Raynor, Simon Mark
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Decision under appeal: Decision of the Examining Division of the
European Patent Office dated 9 April 2003
refusing European application No. 00953275.5
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: C. T. Wilson
Members: F. Brösamle
J. P. Seitz

Summary of Facts and Submissions

I. With decision of 9 April 2003 the examining division refused European patent application No. 00 953 275.5 in the light of Article 82 EPC.

II. Against the above decision of the examining division the applicant - appellant in the following - lodged an appeal on 9 June 2003 paying the fee and filing the statement of grounds of appeal on the same day.

III. Following the board's Communication pursuant to Article 11(1) RPBA in which the board dealt with the prior art documents

(D1) US-A-3111732 and

(D2) EP-B1-0 463 257

the appellant filed new claims according to a **main request** and **first and second auxiliary requests** with fax of 30 April 2004. A third auxiliary request was filed during the oral proceedings.

IV. The independent claims 1 thereof read as follows:

(a) Main request

"1. A distributor device for use in an aluminium casting operation to direct the flow of molten aluminium into a mould, the distributor device including a rigid, substantially bowl-shaped receptacle (2) of a refractory material having a base member (4) and a peripheral wall (6) that

extends upwards from the base member, said receptacle having an inlet opening (8) towards the upper end thereof and at least one outlet opening (14) towards the base thereof, wherein the outlet opening (14) is provided in the peripheral wall (6), the device being constructed and arranged such that in use, molten aluminium poured into the distributor device through the inlet opening (8) is redirected by the distributor device and flows substantially horizontally outwards into the mould through said outlet opening (14); characterised in that the upper surface of the base member (4) is inclined downwards towards the or each outlet opening (14)."

(b) first auxiliary request

"1. A distributor device for use in an aluminium casting operation to direct the flow of molten aluminium into a mould, the distributor device including a rigid, substantially bowl-shaped receptacle (2) of a refractory material having a base member (4) and a peripheral wall (6) that extends upwards from the base member and includes two side wall members (10) and two end wall members (12), said receptacle having an inlet opening (8) towards the upper end thereof and at least one outlet opening (14) in each of said end wall members (12) towards the base thereof, the device being constructed and arranged such that in use, molten aluminium poured into the distributor device through the inlet opening (8) is redirected by the distributor device and flows substantially horizontally outwards into the mould through said

at least one outlet opening (14); characterised in that the upper surface of the base member (4) is inclined downwards towards the or each outlet opening (14)."

(c) second auxiliary request

"1. A distributor device for use in an aluminium casting operation to direct the flow of molten aluminium into a mould, the distributor device including a rigid, substantially bowl-shaped receptacle (2) of a refractory material having a base member (4) and a peripheral wall (6) that extends upwards from the base member, said receptacle having an inlet opening (8) towards the upper end thereof and at least one outlet opening (14) towards the base thereof, wherein the outlet opening (14) is provided in the peripheral wall (6), the device being constructed and arranged such that in use, molten aluminium poured into the distributor device through the inlet opening (8) is redirected by the distributor device and flows substantially horizontally outwards into the mould through said at least one outlet opening (14); characterised in that the upper surface of the base member (4) is inclined downwards towards the or each outlet opening (14) and has an angle of inclination of less than or equal to ten degrees."

(d) third auxiliary request

"1. A distributor device for use in an aluminium casting operation to direct the flow of molten aluminium into a mould, the distributor device

including a rigid, substantially bowl-shaped receptacle (2) of a refractory material having a base member (4) and a peripheral wail (6) that extends upwards from the base member and includes two side wall members (10) and two end wall members (12), said receptacle having an inlet opening (8) towards the upper end thereof and at least one outlet opening (14) in each of said end wall members (12) towards the base thereof, the device being constructed and arranged such that in use, molten aluminium poured into the distributor device through the inlet opening (8) is redirected by the distributor device and flows outwards into the mould through said outlet openings (14); characterised in that the separation of the side wall members (10) increases towards the ends thereof."

- V. In the oral proceedings before the board - held on 8 June 2004 - the appellant essentially argued as follows:
- the problem to be solved by the invention is to enhance the flow distribution towards the cooled side walls of a distributor device for use in an aluminium casting operation;
 - the flow within the distributor device should be smooth and laminar even if the liquid aluminium has momentum when entering the distributor device;

- in contrast to the claimed solution of the above problem (D1) teaches no smooth, horizontal flow and since the bottom of its container is lower than the outlet openings even an upward movement is necessary to reach the outlet opening;
- (D2) discloses a tundish in an iron and steel casting apparatus which aims at enhancing the residence - time of the liquid metal to separate slag from liquid metal; in contrast to the claimed subject-matter according to (D2) the liquid metal flows vertically in and out of the tundish and a base member inclined downwards towards the or each outlet opening cannot be seen from (D2);
- summarizing, the subject-matter of the **main** and **first/second auxiliary request** is novel and inventive;
- with respect to the subject-matter of the **third auxiliary request** no detailed arguments are to be presented to the board since the board in its communication preparing the oral proceedings was positive with respect to the **third auxiliary request**.

VI. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of either:

- (1) his **main request** filed with letter dated 30 April 2004;

- (2) or his **first** or **second auxiliary requests** filed on the same day;
- (3) or his **third auxiliary request** filed during the present oral proceedings.

Reasons for the Decision

- 1. The appeal is admissible.
- 2. *Unity of invention (Article 82 EPC)*

By the rewording of the new sets of claims of the **main** and **first to third auxiliary requests** the requirements of Article 82 EPC are fulfilled since these requests relate to **one** independent claim each and **relate to one invention only**.

Under these circumstances the ground for refusal of the application is met and the crucial issues to be decided are novelty and inventive step in the light of (D1) and (D2).

- 3. *Novelty*

Claims 1 of the **main** and **first to third auxiliary requests** define novel subject-matter since neither (D1) nor (D2) disclose all features thereof, namely an upper surface of the base member inclined towards the or each outlet opening (**main** and **first auxiliary request**), in particular restricted to an angle of inclination of less than or equal to ten degrees (**second auxiliary request**) and with respect to the **third auxiliary**

request the separation of the side wall members increasing towards the ends thereof, see (D1) in particular Figures 2 and 3, reference signs "8" for the base member and "10" for the outlet opening(s) and see (D2), in particular Figures 1 and 8, reference signs "150" and "120/122" for the vertical in- and out-flow of liquid metal.

4. *Inventive step*

Main request and first/second auxiliary requests

4.1 The subject-matter of claims 1 of the **main request** and the **first/second auxiliary requests** solves the problem set out by the appellant, namely the provision of a smooth and laminar flow of the liquid aluminium within the distributor device, by the provision of a base member "inclined downwards towards the or each outlet opening", inclined in particular "less than or equal to ten degrees" so that the **vertically** entering liquid aluminium is redirected within the distributor device into a "substantially horizontal" flow - which is smooth and laminar being a requisite for successful casting of aluminium.

4.2 According to the originally filed documents - in the following WO-A1-01/10584 is addressed - see page 3, lines 25 to 27, and page 8, lines 26/27, an inclined base member **serves the purpose of good drainage**.

4.3 Whether or not there existed a drainage problem in (D1) - seen as the nearest prior art document - it is immediately clear for a skilled person what had to be done for improving any drainage problem, namely to make the bottom "8" higher than the outlet opening(s) "10" of (D1), for example as done in (D2), see in particular Figures 1 and 8 and **the step(s)** provided for in the bottom member of the distributor device - in (D2) being named "tundish", however, serving the same purpose, namely to distribute and redirect liquid metal which is vertically poured into the distributor device/tundish - which step(s) clearly **enhance drainage** of the distributor device/tundish.

4.4 It can be summarized that in the prior art drainage problems were always solved by an inclined base member or by the equivalent measure of different levels between the base member and its outlet(s).

4.5 Claim 1 of the **main request** or the **first/second auxiliary requests** each relates to the provision of an inclined base member which is rendered obvious by the general technical knowledge dealt with in the application itself and the teachings of (D1/D2).

Having an inclined base member in a distributor device/tundish not only solves the drainage problem, but also leads for a skilled person to a smooth flow of liquid metal in it, possibly obviating turbulences and enabling the separation of slag and liquid metal.

4.6 Appellant's findings with respect to the background of the provision of an inclined base member go beyond the information derivable from the application **as filed** and

cannot therefore reason an inventive step based on this feature.

4.7 In claim 1 of the **second auxiliary request** the inclination is restricted to equal or less than ten degrees; again this feature has to be seen in the light of the table of page 7, column "Preferred angle" and line "Base Angle (A)", disclosing a range between "0°-10°", thereby weakening appellant's arguments with respect to the interrelationship between the specific inclination angle of 10° and its results, namely safeguarding a smooth and laminar flow of liquid aluminium in the distributor device.

4.8 The above considerations result in the findings that the board cannot accept the existence of an inventive step of the subject-matter of claim 1 of the **main request** and the **first auxiliary request** - being only different from the **main request** in its modified preamble prescribing **at least** one outlet opening - and the **second auxiliary request** so that these requests are not allowable (Article 56 EPC).

Third auxiliary request

4.9 Claim 1 thereof is characterized by the feature "that the separation of the side wall members (10) increases towards the ends thereof" lending the device a bi-concave shape, see WO-A1-01/10584, page 7, first line, and Figures 1 to 3, 7a and 8/9.

4.10 As can be seen from Figures 7a/7b this feature determines the flow pattern towards the cooled side walls of the distributor device both in a vertical and

horizontal plane as indicated by arrows "32" in these figures.

- 4.11 As set out in the board's communication preparing the oral proceedings before the board, the subject-matter of claim 1 is novel and inventive with respect to the prior art to be considered, namely (D1) and (D2), since the claimed configuration is not known/rendered obvious, but rather has to be seen as a contribution to the prior art requiring inventive endeavour within the meaning of Article 56 EPC. Claim 1 is therefore allowable.
- 4.12 The dependent claims 2 to 14 relate to embodiments thereof and are also allowable.
- 4.13 The description submitted in the oral proceedings before the board is consistent with the claims, sets out (D1) and (D2) as the relevant prior art and the problem to be solved by the claimed invention and is suitable for grant in combination with the drawings originally filed.

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 with the following documents:
 - (1) Claims 1 to 14 filed during the oral proceedings;
 - (2) Amended description pages 1 to 10 filed during the oral proceedings;
 - (3) Figures 1 to 9 as originally filed.

The Registrar:

The Chairman:

A. Counillon

C. T. Wilson