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**Datasheet for the decision
of 12 May 2011**

Case Number: T 1048/09 - 3.2.03
Application Number: 04703122.4
Publication Number: 1590114
IPC: B22D 41/50, B22D 41/28,
D22D 41/56
Language of the proceedings: EN

Title of invention:

Pouring nozzle, pushing device for a pouring nozzle and casting installation

Patentee:

Vesuvius Group S.A.

Opponent:

Refractory Intellectual Property GmbH & Co. KG
Foseco International Limited
Staverma Frabrik für hochfeuerfeste Spezialerzeugnisse GmbH & Co.KG

Headword:

-

Relevant legal provisions:

EPC Art. 100(c), 123(2), 54, 56
RPBA Art. 13(1)

Relevant legal provisions (EPC 1973):

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Keyword:

"Extension of subject-matter or protection (no): Document
filed late in both opposition and appeal proceedings -
admissible (no)"

"Novelty (yes)"

"Inventive step (yes)"

Decisions cited:

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Catchword:

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Case Number: T 1048/09 - 3.2.03

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 12 May 2011

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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
18 March 2009 concerning maintenance of
European patent No. 1590114 in amended form.

Composition of the Board:

Chairman: U. Krause
Members: G. Ashley
J.-P. Seitz

Summary of Facts and Submissions

I. European patent EP-B1-1 590 114 concerns a pouring nozzle for transferring molten metal from one vessel to another. Grant of the patent was opposed by Refractory International Property GmbH (Opponent I), Foseco International Ltd. (Opponent II) and Staverma Fabrik für hochfeuerfeste Spezialerzeugnisse GmbH & Co. KG (Opponent III), which raised objections under Articles 100(a), (b) and (c) EPC.

II. The Opposition Division concluded that the set of claims filed by the patent proprietor during the oral proceedings met the requirements of the EPC. The original decision "to reject the oppositions" has been corrected to "maintenance of the patent in amended form". The decision of the Opposition Division was posted on 18 March 2009.

III. Appellant I (hereinafter referred to as "Opponent III") filed notice of appeal on 5 May 2009, paying the appeal fee on the same day. A statement of the grounds of appeal was filed on 21 July 2009.

Appellant II (hereinafter referred to as "the Patentee") filed notice of appeal on 18 May 2009, having already paid the appeal fee on 5 May 2009. A statement of the grounds of appeal was filed on 27 July 2009.

Appellant III (hereinafter referred to as "Opponent I") filed notice of appeal, grounds of appeal and paid the appeal fee. However, in a letter dated 9 May 2011, it withdrew its opposition.

Opponent II withdrew its opposition (see letter of 1 July 2009), stating that it would not take part in the appeal procedure.

IV. Oral proceedings before the Board were held on 12 May 2011.

V. Requests

The Patentee requested that the decision under appeal be set aside and that the patent be maintained on the basis of claims 1 to 6 of its main request filed on 27 July 2009.

Opponent III requested that the decision be set aside and that the patent be revoked.

VI. Claims

Claim 1 of the Patentee's request reads as follows:

"1. Pouring nozzle (1) for a nozzle insertion and or removal device, wherein the nozzle is constituted of a tubular part (3) defining a pouring channel (6) and, at its upper end, of a plate (2) provided with an orifice defining a pouring channel (6), said plate (2) comprising an upper surface contacting the upstream element (9) of the pouring channel and a lower surface forming the interface with the upper part of the tubular part (3) of the nozzle; said plate (2) comprising two planar bearing surfaces (5) located on both sides of the pouring channel (6) and characterized in that said two bearing surfaces (5) form with the pouring channel axis (7) an angle β of 20° to 80°."

Dependent claims 2 to 4 concern preferred embodiments of the pouring nozzle of claim 1.

Independent claim 5 is directed to a casting installation characterized in that the installation comprises, amongst other features, a pouring nozzle according to anyone of the claims 1 to 4. Dependent claim 6 relates to a preferred embodiment of the casting installation of claim 5.

VII. Prior Art

The following documents, amongst others, were cited in the contested decision:

D2: WO-A-01/81028

D3: EP-A-0 080 672

D10: EP-B1-0 192 019

D11: EP-B1-1 133 373

The Opposition Division decided that D14 (WO-A-01/66285) was *prima facie* not relevant and thus inadmissible; D14 was referred to for the first time in a letter of former Opponent I dated 11 March 2011, and referred to by Opponent III during the oral proceedings before the Board.

VIII. Submissions of the Parties

(a) Article 100(c) and Article 123(3) EPC

Objections under Articles 100(c) and 123(3) EPC were raised by Opponent I; Opponent III did not submit any

additional arguments regarding this issue. The arguments presented by Opponent I can be summarised as follows:

Claim 5 is directed to a casting installation comprising *inter alia* a tube changing device and a bearing surface forming with the pouring channel axis an angle β of 20° to 80° . This amounts to subject-matter not disclosed in the application as originally filed (WO-A-2004/065041), contrary to Article 123(2) EPC. There is also no support for the subject-matter of dependent claim 6, which refers to a single bearing surface, given that the claims upon which it depends define two bearing surfaces.

In defining the pushing device as part of the casting installation, rather than as part of the insertion and removal device as is the case in the granted claims, the scope of protection has been extended contrary to Article 123(3) EPC.

(b) Admissibility of D14

During the oral proceedings before the Board, Opponent III referred to document D14, which had been mentioned in the letter of Opponent 1 dated 11 March 2011. Opponent III argued that the document had been first introduced during the opposition proceedings, albeit late, and had been declared inadmissible by the Opposition Division. However, given that it is highly relevant for the issue of novelty, D14 should be admitted into the appeal proceedings.

The Patentee said that it was surprised that D14 was being referred to at such a late-stage. Given that it had been filed late in both opposition and appeal proceedings, it should not be admitted into the appeal proceedings.

(c) Novelty

Opponent III argued that claim 1 is directed to a pouring nozzle for a nozzle insertion and/or removal device, ie the claim merely concerns a nozzle that is suitable for the intended purpose.

D2 discloses a nozzle having the features of claim 1, and which is made from a material that makes it suitable for a pouring nozzle for molten steel (see paragraph [0002] of D2); D2 also describes the use of nozzles in a removal/insertion device (see Figure 3). Although the nozzle of D2 is referred to as an "inner nozzle", it is nevertheless suitable for the purpose given in claim 1; a nozzle according to D2 and one according to claim 1 lying next to each other in the stores would be indistinguishable. As further evidence of the similarity between an inner nozzle and a pouring nozzle, Opponent III referred to Figure 1 of D3, which shows that around the junction of the tubular part and plate, both nozzles have the same geometry.

Given that D2 discloses a nozzle having the same geometry as that claimed and which is made of a suitable material and which can be used in a removal/insertion device, the subject-matter of claim 1 lacks novelty.

The Patentee referred to paragraph [0004] of the disputed patent, which states expressly that the invention concerns a nozzle intended to slide in a device, and not a fixed nozzle such as an inner nozzle. Claim 1 is directed to a pouring nozzle that is for a nozzle insertion and or removal device, ie it is moveable and not fixed. The claim does not therefore concern fixed inner nozzles such as those disclosed in D2.

(d) Inventive Step

Opponent III argued that the closest prior art for the assessment of inventive step is a pouring nozzle of the type having planar bearing surfaces that form an angle of 90° with the pouring channel axis, as shown in Figure 1 of the disputed patent and as disclosed in D10.

As mentioned in paragraph [0002] of the patent, such nozzles are subjected to stress, so that starting from the nozzle disclosed in D10, the objective problem to be solved is the prevention of cracks forming in the plate of the nozzle.

This problem is also addressed in D2 which teaches that compressive forces, created by the inclined surface of the plate, reduce the appearance of cracks in this region. D2 therefore provides the same solution to the same problem and it would be obvious for the skilled person to make the bearing surfaces of D10 inclined in order to prevent crack formation. Since this corresponds to the solution given in the disputed patent (see paragraph [0020]), the subject-matter of claim 1 lacks an inventive step.

The Patentee emphasised that the patent concerns crack formation at a specific place in the pouring nozzle, namely at the junction between the tubular part and the plate. The cracks that form there are due to flexural stresses in the pouring nozzle (see paragraph [0015] of the patent). D2 relates to an inner nozzle which is not subjected to such flexing, and the cracks referred to in this document are located in a different place, namely the lower face of the plate around the pouring channel. Consequently, D2 does not concern the same type of cracking as the disputed patent and cannot provide a solution to the objective problem.

The problem of cracking at the junction between the tubular part and the plate of a pouring nozzle is, for example, addressed in D11, but here the solution is to provide an intermediate shock-absorbing layer, which does not give fully satisfactory results (see paragraphs [0013] and [0016] of the disputed patent). Since the claimed solution of forming the bearing surfaces with an angle β of 20° to 80° to the pouring channel axis is not suggested in the prior art, the claimed subject-matter has an inventive step.

Reasons for the Decision

1. The appeals are admissible.
2. Article 100(c) / Article 123(2) EPC
 - 2.1 Claim 5 is directed to a casting installation comprising *inter alia* a tube changing device and a

- bearing surface forming with the pouring channel axis an angle β of 20° to 80° . Opponent I raised the objection that the subject-matter of claim 5 was not disclosed in the application as originally filed (WO-A-2004/065041).
- 2.2 A "tube changing device" is referred to in claim 10 of the original application. The description itself does not use this expression, but refers to a "nozzle and exchange device"; nevertheless it is clear that both of these expressions concern the same device. A description of the casting installation is given in paragraphs [0032] to [0034] of the patent application, which includes all the features defined in claim 5.
- 2.3 Opponent I also argued that the feature of an angle β of 20° to 80° is only disclosed in respect of the pouring nozzle and not in respect of the angle of the bearing planes, as is now defined in claim 5. The rail-guide system is described in the application as having a bearing surface forming, with respect to the pouring axis, an angle substantially equal to the angle β (see paragraph [0034] of the application), and angle β is defined in paragraph [0019] as being 20° to 80° ; hence this feature is supported in the application.
- 2.4 Opponent I also submitted that there is no basis for a casting installation comprising a single bearing surface, as is defined in claim 6, given that the claims to which claim 6 refers define two bearing surfaces. This formulation of the claims was, however, already present in the claims of the patent application (see claim 9), and is an issue under Article 84 EPC, rather than Article 123(2) EPC.

2.5 Consequently, the subject-matter of claims 5 and 6 is disclosed in the patent application as originally filed and there is no objection under Article 100(c) EPC.

3. Article 123(3) EPC

3.1 Claim 5 contains features of granted claims 6 and 8. Opponent I argued that claim 5 is broader in scope because claims 6 and 8 define the pushing device as part of the insertion and removal device, whereas claim 5 merely requires it to be part of the casting installation without the need for it to be part of the insertion and removal device.

3.2 The expressions "tube changing device" and "insertion and/or removing device" are considered to be equivalent (see above). In addition, the function of the pushing device is inextricably linked to the inserting and removal device, ie if a pushing device is present it must be there as a part of an inserting and removal device. There is therefore no extension of protection contrary to Article 123(3).

4. Admissibility of Document D14

4.1 D14 had been introduced late into the opposition proceedings. The Opposition Division did not consider the document to be *prima facie* relevant and hence did not admit it into the proceedings (see point 17 on page 6 of the contested decision). In appeal proceedings, D14 was not referred to in any of the parties' grounds of appeal, although they were aware of

- the document, but was mentioned for the first time in the letter of Opponent I dated 11 March 2011.
- 4.2 Given that D14 was filed late both in opposition and appeal proceedings, any submissions based on this document would amount to an abuse of procedure. Consequently the Board exercises its discretion under Article 13(1) RPBA not to admit D14 into the proceedings.
5. Novelty (Article 54 EPC)
- 5.1 Opponent III alleges that the subject-matter of claim 1 lacks novelty in light of Document D2.
- 5.2 D2 discloses a nozzle for a metallurgical vessel. The nozzle in question is referred to as "inner nozzle (2)" and, as can be seen in Figure 1 of D2, is fixed within the base of a tundish. The question is whether this nozzle can be considered to be a "pouring nozzle" in the sense of claim 1. The Opposition Division thought not (see page 7, first paragraph).
- 5.3 Opponent III argues that claim 1 is directed to a nozzle *per se*, which merely has to be suitable for a nozzle insertion and or removal device. Given that the nozzle of D2 is made from suitable materials for a pouring nozzle and is also used in a nozzle insertion and removal device, it is a nozzle that can fulfil the purpose of claim 1.
- 5.4 However, the patent specification states in paragraph [0004] that in the context of the invention a pouring nozzle is intended to slide in a device and is not a

fixed nozzle such as an inner nozzle. This is reflected in claim 1 by defining the pouring nozzle as having at its upper end a plate (2) with an upper surface that contacts the upstream element (9) of the pouring channel; upstream element (9) is defined in the disputed patent as being the inner nozzle (see paragraph [0043] and Figures 4 to 6). In contrast, the inner nozzle of D2 has an upper surface that contacts the metal in the tundish and a plate at its lower end with a lower surface that contacts the downstream element of the pouring channel (submerged entry nozzle (8)). It is therefore clear that the pouring nozzle of claim 1 equates to submerged entry nozzle (8) of D2 and not to the inner nozzle (2). Conversely, the inner nozzle of D2 cannot be seen as a pouring nozzle in the sense of claim 1.

5.5 Since D2 does not disclose a pouring nozzle having all of the features of claim 1, in particular the bearing surfaces do not form an angle with the pouring channel axis, the Board agrees with the conclusion of the Opposition Division that the claimed subject-matter is novel with respect to D2.

6. Inventive Step (Article 56 EPC)

6.1 The disputed patent concerns a pouring nozzle comprising a tube, the upper end of which is in the form of a plate with a central orifice. The upper surface of the plate slides into contact with an inner nozzle that is fixed in a metallurgical vessel. The lower surface of the plate forms a planar bearing surface, and the pouring nozzle is held in place by a thrust force, for example generated by a spring, acting

- on this surface. The problem addressed by the invention is prevention of cracks forming at the junction between the plate and the tube (see paragraphs [0008] and [0017] of the disputed patent).
- 6.2 The parties agree that the starting point for the invention is a pouring nozzle of the type shown in Figure 1 of the patent, and the Board sees no reason to depart from this view. Such a nozzle corresponds to that of D10 (cited in the introduction to the disputed patent), and comprises two planar bearing surfaces at right angles to the pouring channel axis (see Figure 3 of D10); these enable the pouring nozzle to slide by means of guides into position against the inner nozzle.
- 6.3 The claimed pouring nozzle differs from that of D10 in that the bearing surfaces are defined as being at 20° to 80° to the pouring channel axis. The effect of this feature is that the stresses in the pouring nozzle are lower and cracking is reduced (see paragraphs [0026] and [0027] of the patent specification). The objective problem to be solved thus corresponds to that underlying the invention, namely the prevention of cracks in the pouring nozzle.
- 6.4 The question is therefore whether it would be obvious to set the bearing surfaces at this angle in order to achieve the desired effect. Opponent III submits that the solution can be derived from D2 and in particular the teaching of paragraph 18.
- 6.5 D2 relates to a device for clamping the inner nozzle to a replaceable submerged entry nozzle. The lower end of the inner nozzle has a plate, the upper surface of

which is inclined to improve the clamping action (D2, paragraphs [0016] and [0017]). An further advantage of the inclined surfaces is said to be that compressive forces are directed to the lower face of the plate, with the result that effects of cracks in this region are reduced (D2, paragraph [0018]).

6.6 It is clear that the cracks in the inner nozzle of D2 are located in a different region to those of the pouring nozzle described in the patent. The cracks in the nozzle of D2 are located in the lower face of the plate around the pouring channel at the base of the nozzle. In contrast, the cracks of the pouring nozzle appear in the upper part of the nozzle at the junction between the tubular part and the plate, and emanate in the corner away from the pouring channel. One important cause of these cracks in the pouring nozzle is the vibration and flexing of the pouring nozzle as liquid metal flows through it (see paragraph [0015] of the disputed patent). The inner nozzle, on the other hand, is not subjected to such flexing as it is held rigidly within the base of the tundish or ladle (see Figure 1 of D2).

6.7 Since D2 concerns a different type of nozzle with cracks located in a different region and originating from a different source, the skilled person is not encouraged to seek a solution in this document. Rather, the skilled person would turn to a document such as D11, which also deals with the type of cracking addressed in the patent. D11 suggests incorporating a shock-absorbing interface between the pouring nozzle and the clamp as a means for solving the problem (see Figures 6

and 7 and paragraphs [0017] and [0018] of D11); this is a different solution to that proposed in the patent.

6.8 In summary, the skilled person would not consult D2 in expectation of finding the solution to the posed problem, but would refer to documents that deal with the same type of cracking. Although one solution is proposed in D11, there is no indication of the claimed solution of setting the two bearing surfaces at an angle of 20° to 80° to the pouring channel axis. The claimed pouring nozzle and casting installation therefore have an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to maintain the patent in the following amended version:

Claims 1 to 6 filed on 27 July 2009;

Description columns 1 to 6,
as filed during the oral proceedings;

Figures 1 to 6 as granted.

The Registrar:

The Chairman:

D. Meyfarth

U. Krause