

Veröffentlichung im Amtsblatt	J/Nein
Publication in the Official Journal	Yes/No
Publication au Journal Officiel	Oui/Non

Aktenzeichen / Case Number / N^o du recours : T 616/89 - 3.4.2

Anmeldenummer / Filing No / N^o de la demande : 84 201 697.4

Veröffentlichungs-Nr. / Publication No / N^o de la publication : 0 143 498

Bezeichnung der Erfindung: Measurement and/or sampling device for liquid metal
Title of invention: and probe used thereby
Titre de l'invention :

Klassifikation / Classification / Classement : G01N 1/12

ENTSCHEIDUNG / DECISION

vom / of / du 19 October 1990

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Electro-Nite International N.V.

Einsprechender / Opponent / Opposant :

- 1) Thyssen Stahl AG
- 2) Ferrotron Elektronik GmbH

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 123(3), 56 EPC

Schlagwort / Keyword / Mot clé :

Main request not allowable (Article 123(3))
Auxiliary request: Inventive step (Yes)

Leitsatz / Headnote / Sommaire



Case Number : T 616/89 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 19 October 1990

Appellant : Electro-Nite International N.V.
(Proprietor of the patent) Grote Baan 27a
B-3530 Houthalen

Representative : Debrabandere, René
BUREAU DE RYCKER
Vereenigde Octrooibureaux Belgie N.V.
Arenbergstraat 13
B-2000 Antwerpen

Respondent : Thyssen Stahl AG
(Opponent 01) D-4100 Duisburg

Representative : Patentanwaltsbüro
Cohausz & Florack
Postfach 14 01 20
Schumannstrasse 97
D-4000 Düsseldorf 1

Respondent : Ferrotron Elektronik GmbH
(Opponent 02) Am Schürmannshütt 30
D-4130 Moers

Representative : Patentanwälte
Dipl.-Ing. Walter Kuborn
Dipl.-Phys. Dr. Peter Palgen
Mulvanystrasse 2
D-4000 Düsseldorf

Decision under appeal : Decision of the Opposition Division of the European
Patent Office dated 31 July 1989 revoking
European patent No. 0 143 498 pursuant to
Article 102(1) EPC.

Composition of the Board :

Chairman : E. Turrini

Members : M. Chomentowski

M.V. Lewenton

Summary of Facts and Submissions

- I. The European patent No. 0 143 498 was granted on the basis of the European patent application No. 84 201 697.4.
- II. Oppositions were filed requesting revocation of the patent.
- III. The European patent was revoked by a decision of the Opposition division, the subject-matter of Claim 1 being considered as lacking an inventive step.
- IV. The Appellant (Proprietor of the patent) lodged an appeal against this decision.
- V. In the annex to the invitation for oral proceedings, the Board expressed the provisional opinion that a clarified Claim 1 could be allowable with regard to the available prior art.
- VI. During the oral proceedings, which were requested subsidiarily by one of the Respondents (the Opponents), the Board expressed the opinion that Claim 1 filed with letter dated 10 September 1990 lacked clarity in the sense of Article 84 EPC since the embodiment illustrated by Fig. 3 and 4 of the patent in suit, which discloses a tube (11, 12) separated from the stop shoulder (9) by the elastic ring (13) was indeed not consistent with the wording of Claim 1 because it does not include the claimed feature of the joining of the tube (11, 12) against the stop shoulder (9). Then, the Appellant filed a main request and an auxiliary request for maintaining the European patent in an amended form according to two different amended texts of the claims.

VII. Claim 1 according to the main request reads as follows:
"1. Converter containing a liquid metal and comprising a substance (2) as an immersion lance on the end whereof a disposable probe (3) is mounted, said probe (3) comprising a measurement and/or sampling part (10) and a tube (11, 12) carrying said part (10) at its one end, said tube (11, 12) being mounted by its other end over a part of the substance (2) on the outside of said substance (2) said substance (2) comprising a stop shoulder (9) on its end, and further comprising an elastic ring (13) which seals elastically the slit between the tube (11, 12) of the probe (3) and the stop shoulder (9) of the substance (2) on the outside of said slit, the ring (13) being elastically deformed to a determined extent against the stop shoulder (9) in the state of rest of the tube (11, 12)."

The main request includes also dependent Claims 2 to 19.
Claim 1 according to the auxiliary request reads as follows:

"1. Converter containing a liquid metal and comprising a substance (2) as an immersion lance on the end whereof a disposable probe (3) is mounted, said probe (3) comprising a measurement and/or sampling part (10) and a tube (11, 12) carrying said part (10) at its one end, said tube (11, 12) being mounted by its other end over a part of the substance (2) on the outside of said substance (2) against a stop shoulder (9) on the end of the substance (2), and further comprising an elastic ring (13) which seals elastically the joining of the tube (11, 12) of the probe (3) against the stop shoulder (9) of the substance (2) on the outside of said joining, the elastic ring (13) being elastically deformable in that way that, in a state of rest of the tube, the tube (11, 12) of the probe (3) joins the stop shoulder (9) of the substance (2)."

The auxiliary request includes also dependent Claims 2 to 15.

VIII. The Respondents requested the revocation of the patent. They provided the following arguments. Starting from the generic prior art, which is known for instance from Fig. 5 of D3 (DE-C-1 919 117), with the tube being mounted over a part of the substance against the stop shoulder at the lower part of the substance, the person skilled in the art will become aware that, after a few times, the substance cannot be used anymore because there is some burr of solidified metal at the location of the joining and that, for this reason, no electrical contact can be made between the part of the electrical circuit in the substance and the electrical connections of the probe in said tube. An average person skilled in the art must therefore notice this problem. The spontaneous solution is to provide a sealing of said joining to keep the melt out. Materials for such sealing are known, for instance rubber or cardboard. It is generally known that rubber can provide the tightening function and there is no surprising effect resulting from the selection of rubber in place of, for instance, cardboard, because both materials can resist the high temperature for the time necessary for the measurement; in particular, the tightening (i.e. coupling) function is known from D1 (DE-C-1 266 024) and the protecting function is also derivable from the same D1 (see column 5, lines 9-12). Therefore, the person skilled in the art will arrive at the claimed device just by using his professional knowledge. Independently from the foregoing arguments, it is to be noted that Fig. 9 of the patent in suit discloses a radial deformation of the elastic ring coupling the two parts, which is already disclosed in D1 (see Fig. 1). Therefore, the subject-matter of the invention is also obvious for this reason.

Reasons for the Decision

1. The appeal is admissible.
2. Main request
- 2.1 Allowability of the amendments

According to the wording of Claim 1, an elastic ring seals elastically "the slit between the tube (11, 12) of the probe (3) and the stop shoulder (9) of the substance (2) on the outside of said slit". According to the wording of Claim 1 of the patent as granted, the elastic ring "seals the junction of the tube (11, 12) of the probe (3) against the stop shoulder (9) of the immersion lance (2) at its outside". However, "a junction of two elements whereby one of said elements is located against the other" is a particular configuration of the more general configuration "a slit between two elements", since in a slit, the elements constituting the slit can be either one against the other, i.e. in contact with each other, or spaced from each other (see for instance, in the patent in dispute, column 4, lines 55-59, column 5, lines 41-44 and Fig. 4, for an example of a slit between the extremity of part 12 of tube 11, 12 and the stop shoulder 9, which make no direct contact; in contrast therewith, see column 5, lines 54-56 and Fig. 5-15, wherein the elastic ring does not obstruct the direct connection, i.e. the junction, of the extreme edge of the part 11, 12 against the stop shoulder 9, i.e. the junction of the elements of the slit). Therefore, by substituting "slit" for "junction against", the amendments contravene the requirement of Article 123(3) EPC that the claims of the European patent may not be amended during opposition proceedings in such a way as to

extend the protection conferred. Therefore, the main request of the Appellant is not allowable.

3. Auxiliary request

3.1 Allowability of the amendments

3.1.1 Claim 1 results from the combination of the features of Claim 1 as granted with the features of dependent Claims 19 (for the feature of the converter) and 6 (for the feature of the elastic ring being elastically deformable in that way that, as in a state of rest, the tube (11, 12) of the probe (3) joins the stop shoulder (9) of the immersion lance (2)), both as granted. Moreover, the new Claim 1 is based on the embodiments illustrated by Fig. 1-2 and 5-15, as originally filed. Therefore, the Board is satisfied that the new Claim 1 does not contravene the requirement of Article 123(3) EPC.

3.2 Clarity of the claims

All the embodiments of the invention, illustrated in the remaining Fig. 1-2 and 5-15 (the embodiment corresponding to Fig. 3 and 4 being cancelled) are concerned with converters comprising a substance (2), whereby an elastic ring seals elastically the joining of the tube (11, 12) of the probe (3) against the stop shoulder (9) of the substance (2). Therefore, the Board is satisfied that Claim 1 is clear in the sense of Article 84 EPC.

3.3 Novelty

The subject-matter of Claim 1 is novel since none of the documents of the available prior art discloses a converter comprising all the features of the converter of

present Claim 1. It is to be noted that the novelty of the subject-matter of Claim 1 has not been contested.

3.4 Inventive step

3.4.1 A converter containing a liquid metal and comprising a substance (Hilfssonde (2)) as an immersion lance on the end whereof a disposable probe is mounted, said probe comprising a measurement and/or sampling part (Detektor (1)) and a tube (Stahlrohr (18)) carrying said part (1) at its one end, said tube (18) being mounted by its other end at a part of the substance (2) against a stop shoulder on the end of the substance (2), is known from D3 (see column 4, line 22 - column 5, line 19; column 6, lines 25-42; Fig. 5 and 6). It is to be noted that the disposable probe is connected with the substance (2) by a steel tube (18) having a screw-thread at both ends and that Fig. 5 discloses that the lower part of the substance (2) has an opening which also includes a screw-thread (see D3, column 6, lines 25-29 and Fig. 5); therefore, it is directly and unambiguously derivable from D3 that the tube (18) is not mounted over the substance (2), on the outside of it.

- 3.4.1.1 The subject-matter of Claim 1 differs therefrom in that it further comprises the following features:
- the tube is mounted over a part of the substance, on the outside of said substance, and not in the inside of said substance, as in D3;
 - it comprises an elastic ring which seals elastically the joining of the tube of the probe against the stop shoulder of the substance on the outside of said joining, the elastic ring being elastically deformable in that way that, in a state of rest of the tube, the tube of the probe joins the stop shoulder of the substance.

- 3.4.1.2 A problem with the converter known from D3 is that, at the immersion of the probe, during oxygen blow, liquid metal and slag will splash up and, as a consequence, splashed up liquid metal can prevent the complete screwing off and on of the probe (see for instance page 3, Paragraph "1" of the letter dated 16 November 1989 of the Appellant).
- 3.4.1.3 The converter including all the features of the present Claim 1 intends to solve this problem.
- 3.4.2 Indeed, D2 (Prospectus of the Firm Ferrotron Elektronik GmbH: "FOX, Ferrotron Oxygen"; Sauerstoff-Meßsonde für flüssige Metallbäder"; No. 1 - Stand Januar 1976, with added photos of the sold sampling device, Anlage 2, and a copy of Bill No. 395, dated 9 February 1976 proving the disposal of 100 sampling devices) discloses a device for measuring the content of oxygen dissolved in liquid metal, whereby the measuring probe (a measuring head in a tube (12) of boards and ceramics) is mounted on a ceramic substance; a cardboard tube (13), is provided on the cardboard tube (12) surrounding the measuring probe; said cardboard tube (13) also surrounds the substance (2), at the location where the tube (12) is in contact with the shoulder (9) of the substance (2) (see in particular in "Anlage 1", the last Paragraph of the first page and the two first Paragraphs of the second page; the second item of the third page; the second item of the fourth page and the second item of the fifth page; in "Anlage 2", the Figures 1 and 3). It is to be noted that the Appellant has neither contested the technical content of D2 and, in particular, the function of protection of the cardboard tube (13), nor the availability to the public of the technical teaching of D2.

- 3.4.2.1 Taking into account that this function of protection of the cardboard tube (13) of D2 could be recognized by a person skilled in the art, and taking into account that D2 and D3 belong to the same technical field of converters comprising measuring and/or sampling devices, the person skilled in the art could indeed have been aware that an advantage, i.e. a device having a better protection, could be obtained by providing a protection tube of cardboard around the device at the joining of the substance and the tube carrying the probe; therefore, adapting the structure of D3 and providing a tube mounted over an end part of the substance, on the outside of said substance, as in D2, and further providing the protection tube (13) of D2 in the device known from D3 may be considered as obvious technical steps.
- 3.4.2.2 However, this particular step of providing the cardboard protection tube (13) by combining the teaching of D3 and D2 does not result in the subject-matter of Claim 1 because it does not result in an elastic ring which seals elastically the joining of the tube of the probe against the stop shoulder of the substance on the outside of said joining, the elastic ring being elastically deformable in that way that, in a state of rest of the tube, the tube of the probe joins the stop shoulder of the substance.
- 3.4.3 Indeed, D1 discloses an elastic ring (Gummimanschette (16)) coupling the sampling tube (15) with the body of the pump in a device for taking samples from a liquid metal (see Fig. 1; column 5, lines 9-12).
- 3.4.3.1 However, the function of the elastic ring (16) of D1 is to couple the sampling tube (15), and the tube protruding from the body of the pump and to provide an easy removal and change of the sampling tube (15) (see Fig. 1; column 5, lines 9-12). No function of protection is

mentioned in relation with this elastic ring (16), and in particular no function of protection of a joining between the tube (15) and the lance portion protruding from the body of the pump against metal liquid splashing up from the melt, can be derived from D1. Moreover, it is to be noted that Fig. 1 of D1 does not disclose any joining of the tube (15) with the lance portion located at the lower part of the pump body, which are shown in said Fig. 1 as being separated from each other.

Indeed, a coupling of said parts of the pumping system by an elastic ring (16), as in Fig. 1 of D1, which results in the tube being mechanically attached to the lower part of the pump body and further in a continuous pumping channel from the tube (15) to the pump, fulfills said function of coupling in the sense of the pumping device of D1.

3.4.3.2 On the other hand, the only function which can be directly and unambiguously derived from D2 for the cardboard tube (13) is a function of protection. There is no indication in D2 that the cardboard tube (13) has any function of coupling parts of the device, i.e. maintaining mechanically parts of the device, i.e. the substance (2) and the tube (12) carrying the probe (see Fig. 2 and 3 of Anlage 2 of D2, from which it is directly and unambiguously derivable that said parts (2) and (12) are held together without the cardboard tube (13) between them (see, in comparison, Fig. 1 of D2, with the cardboard tube (13) in the completed device).

3.4.4 Therefore, since the elastic ring (16) of D1 and the cardboard tube of D2 have different functions, they cannot be considered as equivalent technical means and, therefore, the elastic ring (16) of D1 cannot be substituted for the cardboard tube of D2 in an obvious way.

3.5 The argument of the Respondents that the person skilled in the art would become aware of the problem of burrs from his own experience, when joining the tube carrying the probe over the substance, and would find the solution to this problem from his professional expertise, is not convincing since D3, which is the closest prior art, does not disclose such a structure of the tube over the substance, and therefore, said particular problem was not recognized by the inventors of the device known from D3 (see Fig. 5 and column 6, lines 25-29 of D3).

3.6 The argument of the Respondents mentioned in the preceding Paragraph, that the person skilled in the art would become aware of the problem of burrs from his own experience, is not convincing, even by taking as the generic prior art device a device as disclosed in D2 and having said structure of the tube carrying the probe mounted over the substance, since the problem of avoiding burrs at the joining of the tube carrying the probe with the stop shoulder of the device is already solved by the protecting tube of cardboard of D2. However, a problem of the device known from D2 can be seen in the possibility of dimensional change of the slit formed by the tube carrying the probe against the stop shoulder (9), which can result in an insufficient sealing of the slit by the protecting tube (13) of D2 since said protecting tube of D2 does not compensate the dimensional change of said slit, which can occur because of vibrations of the immersion lance (see the patent in suit, column 1, lines 43-45; column 2, lines 6-9; see also Paragraph 7 and pages 1-3a of the letters of the Appellant dated 16 November 1989 and 10 September 1990, respectively). Therefore, the elastic ring of the present invention has a further protecting function of elastically sealing the slit and tightening it for forming a joining of the tube

and the stop shoulder, as mentioned in the present Claim 1, which is different from the protecting function of the cardboard tube of D2, and is not suggested by any of the documents D2 or D1.

3.7 The argument of the Respondents that the embodiment of Fig. 9 of the patent in suit, which discloses an elastic ring which is deformed radially, is not inventive with regard to Fig. 1 of D1, wherein an elastic ring is also located around the two parts of a device to be coupled, whereby the part of the elastic ring surrounding the part of the pump is also deformed radially, is not convincing since, in Fig. 1 of D1, the parts of the device surrounded by the elastic ring are not joining and D1 does not suggest such a joining.

3.8 Therefore, the subject-matter of Claim 1 implies an inventive step (Art. 56 EPC) and Claim 1 is allowable (Art. 52(1) EPC).

3.9 Thus, taking into consideration the amendments made by the proprietor of the patent, the patent and the invention to which it relates meet the requirements of the Convention and the patent as amended may be maintained (Art. 102(3) EPC).

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Opposition division with the order to maintain the patent in amended form on the basis of the following documents of the auxiliary request of the Appellant:
 - Claim 1 and the dependent Claims 2-15;
 - description pages 1-3, 3a and 3b filed with letter dated 10 September 1990,
 - description column 2, line 36-column 7, line 54 of the granted patent,
 - drawing sheets 1-3 of the granted patents, with the following amendments:
 - on page 3a of the new preamble, line 12, FR-A-1 413 653 should read FR-A-2 413 653, and
 - in the specification, the description of the drawings 3 and 4 and in the drawings, the Figures 3 and 4 should be deleted.
 - with the further amendments necessary to adapt the description and drawings to the text of the valid Claim 1.

The Registrar

The Chairman

P.Martorana

E.Turrini