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File Number: T 561/89 - 3.2.4
Application No.: 82 201 601.0
Publication No.: 0 081 890
Title of invention: High-vacuum molecular pump

Classification: F04D 19/04

D E C I S I O N
of 29 April 1991

Proprietor of the patent: Ultra-Centrifuge Nederland N.V.

Opponent: Leybold AG

Headword:

EPC Articles 56, 114; Rule 58(4)

Keyword: "Inventive step - yes"
"new filed document: response to the decision"

Headnote



Case Number : T 561/89 - 3.2.4

D E C I S I O N
of the Technical Board of Appeal 3.2.4
of 29 April 1991

Appellant :
(Opponent)

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Representative :

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Respondent :
(Proprietor of the patent)

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Decision under appeal :

Interlocutory decision of the Opposition Division
of the European Patent Office dispatched
4 July 1989 concerning maintenance of European
patent No. 0 081 890 in amended form.

Composition of the Board :

Chairman : C. Andries
Members : M. Hatherly
C. Holtz

Summary of Facts and Submissions

- I. European patent application No. 82 201 601.0, filed on 13 December 1982 and published with the publication No. 81 890, was granted on 9 October 1985.
- II. The patent was opposed by the Appellant (Opponent) who requested the revocation of the patent in its entirety on the grounds of lack of patentability (Articles 52 to 57 EPC), relying on the following documents:

 - (D1) DE-C-2 411 247
 - (D2) DE-A-2 443 727
- III. In its interlocutory decision dispatched on 4 July 1989 the Opposition Division found no grounds for opposition under Article 100 EPC to maintenance of the patent as amended on the basis of the documents specified in the communication pursuant to Rule 58(4) EPC dated 9 November 1988. According to the Opposition Division neither of the cited documents disclosed an annular gas supply chamber which allowed an increase of the pumping speed in a simple manner.
- IV. The appeal by the Appellant against this interlocutory decision was received on 26 August 1989, the appeal fee being paid on the same day. The statement of grounds of appeal was received on 2 November 1989.
- V. Both the Appellant and the Respondent (Proprietor of the patent) made subsidiary requests for oral proceedings. On 7 February 1991 a facsimile was sent to the parties stating that the Board intended to summon them to oral proceedings. By letter of 13 February 1991 the Appellant withdrew his subsidiary request for oral proceedings and

stated that, if nevertheless an oral proceedings did take place, he would not attend. The summons to oral proceedings was thereafter dispatched to both parties. Nobody was present for the Appellant in the oral proceedings on 29 April 1991; in accordance with Rule 71(2) EPC the appeals proceedings was continued without him.

- VI. At the end of the oral proceedings, the Respondent filed a new set of Claims 1 to 3 and an amended description. Claim 1 now reads as follows:

"High-vacuum molecular pump comprising at least two coaxial elements mounted rotatably relative to each other and at a small distance from each other, said elements being cylindrical over at least a major part of their length, wherein a cylindrical wall portion of one of the elements positioned opposite a cylindrical wall portion of the other element is provided with at least one helical groove, and wherein a pump space is present between these two cylindrical wall portions of the elements, which pump space is in communication with a gas supply and a gas discharge, wherein near an end of a pair of elements adjacent to but beyond the cylindrical part of at least one of said elements a substantially annular gas supply chamber is present, which annular gas supply chamber is in communication both with the gas supply and with the pump space, characterized in that the annular gas supply chamber is laterally bounded by the elements mounted rotatably relative to each other, that the helical groove extends into the annular gas supply chamber, and that the elements which bound the annular gas supply chamber are so shaped that near the gas supply the annular gas supply chamber is wide relative to the pump space and that the annular gas supply chamber narrows gradually downstream

towards the pump space, one of said elements being conical or having the shape of a surface of revolution obtained by revolving a curved line about the axis of rotation of the element over at least part of the height of the gas supply chamber."

- VII. In addition to the state of the art discussed in the opposition proceedings, the Appellant cited the following document for the first time in the appeal proceedings:

(D3) US-A-1 492 846

He argues that each half of the therein disclosed double high-vacuum molecular pump has an annular gas supply chamber formed by two coaxial elements and communicating with a pump space between said elements. The screw shaped ridge which creates the pumping effect in the pump space extends into the annular gas supply chamber. One of the chamber forming elements is conical in the region of the chamber which narrows towards the pump space. He maintains that the subject-matter of the disputed Claim 1 differs from this state of the art only in that - for an unexplained reason - the elements forming the pump space are cylindrical over at least a major part of their length whereas one of the prior art elements is conical - as in the embodiment shown in Fig. 2 of the disputed patent.

- VIII. The Respondent's written and oral arguments are that the disclosure of document D3 is no nearer to the invention than that of the other prior art documents available in the proceedings prior to appeal. He maintains that document D3 discloses no annular chamber in the meaning of Claim 1.

- IX. The Appellant's request according to the file is that the decision under appeal be set aside and that the patent be revoked.
- X. The Respondent's request is that the appeal be dismissed and that the patent be maintained on the basis of the following documents:

Claims 1 to 3 as filed during the oral proceedings,

Description pages 1, 2 and 2a as well as column 2, line 24 to column 4, line 41 as filed during the oral proceedings, and

Drawings sheets 1 to 3 as published in the patent specification.

Reasons for the Decision

1. The appeal satisfies Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.
2. **Amendments**
 - 2.1 The originally filed Claim 1 was merely clarified and rearranged to arrive at Claim 1 as granted. The amendments made to Claim 1 as granted to arrive at the present Claim 1 are supported by the originally filed application. The cylindrical shape of the elements and the position of the chamber can be derived from Figs. 2 and 7. The cylindrical internal surface of the casing 1 is formed by the face of the ridge located between two neighbouring parts of the groove 5 and which face is adjacent the cylindrical surface of the other element 2.

The particular shape of one element over at least part of the height of the chamber is disclosed in page 4, line 29 to page 5, line 5 of the original description.

The subject-matter of Claim 1, therefore, has been restricted to these particular shapes.

- 2.2 The present Claim 2 consists of Claim 3, both as originally filed and as granted, merely clarified and restricted.
- 2.3 The present Claim 3 corresponds to Claim 4 as originally filed and granted.
- 2.4 The description differs from the version as granted by being adapted to the new Claim 1 and corrected in column 3, line 15 to what is apparent from Figs. 2 and 7. There are, therefore, no objections to this version of the description.
- 2.5 Summarising, the Board is of the opinion that there are no objections under Article 123 EPC to the amended claims and description.
3. Document D3, although cited for the first time in the statement of grounds of appeal, cannot, according to the Board, be considered as not having been submitted in due time in the sense of Article 114(2) EPC. The document has to be seen as a clear response to the Opposition Division's decision which stated that neither of the documents cited during the opposition proceedings disclosed an annular gas supply chamber as claimed in the opposed European patent.

The Board's opinion is that an Appellant must have the opportunity to fill at least that gap in his former reasoning which has been clearly defined in the impugned decision.

4. Novelty

- 4.1 Document D3 discloses a high-vacuum molecular pump (see page 1, lines 8-11) comprising a rotor 17 coaxially mounted rotatably relative to a stator 10 at a small distance from each other (see page 1, lines 100-108), said stator and rotor being cylindrical (see page 1, line 74 and page 2, lines 8 and 9) over their whole length. The cylindrical wall portion of the stator 10 positioned opposite the cylindrical wall portion of the rotor 17 is provided with two helical grooves (see page 1, lines 83-85). The bottom of each groove forms a conical shape. A pump space between the rotor and stator is in communication with a gas inlet pipe 12 and an outlet pipe 15 (see Fig. 2). The gas inlet pipe 12 communicates with the interior of the stator 10 at the middle of its length from whence the molecules move along one or other helical groove towards one or other end of the stator.

Fig. 1 of document D3 shows that each helical groove extends to the middle of the length of the pump (to section line 2-2). The space where the gas inlet pipe 12 leads into the helical grooves (either side of the section line 2-2) cannot be termed an annular gas supply chamber in the meaning of the opposed patent i.e. an additional, separate chamber which is in communication both with the gas inlet pipe and with the pump space, since that space cannot be considered as a separate space but only as a direct connection from the inlet pipe 12 to each

respective groove 13 (see page 1, lines 85-87 and page 2, lines 105-107). Indeed the inlet pipe 12 only intersects the helical grooves perpendicularly, and the space shown in Fig. 1 as merging into the helical groove at the intersection of section line 2-2 and shaft 18, and in Fig. 2 merging just above the reference numeral 14 (over a 90° arc) is only the intersection of both grooves with each other. That space therefore is part of (rather than additional to) each helical groove and is, moreover, not substantially annular.

- 4.2 The Board is thus satisfied that the novelty of the subject-matter of the present Claim 1 is not destroyed by the disclosure of document D3, which was the only document discussed by the Appellant during the appeal proceedings.
- 4.3 Moreover, the Board is satisfied that none of the prior art documents available to it (including DE-A-2 411 247 corresponding to the late published document D1) discloses a high-vacuum molecular pump having all the features set out in Claim 1, in particular none of them discloses an annular gas supply chamber shaped as defined by said Claim 1.
- 4.4 Thus, the subject-matter set forth in Claim 1 is to be considered as novel within the meaning of Article 54 EPC.
5. **Inventive step**
- 5.1 The problem to be solved as defined in the description of the opposed European patent, i.e. to increase in a simple manner the pumping speed for a given rotor speed, is, according to the Board, solved by the specific constructional arrangement of the claimed annular gas

supply chamber. This has not been contested by the Appellant during the present appeal proceedings.

- 5.2 The Opposition Division already correctly pointed out in the impugned decision that the Appellant did not bring forward documents in the opposition proceedings disclosing that specifically claimed annular gas supply chamber (above point III). The Appellant did not dispute that statement during the appeal proceedings.
- 5.3 As already pointed out in above points 4.1 and 4.2, the Appellant did not succeed during the appeal proceedings in bringing forward a prior art document disclosing that missing, specifically defined, annular gas supply chamber.
- 5.4 Therefore, summarising, neither during the opposition proceedings, nor during the appeal proceedings, did the Appellant bring forward prior art documents which disclosed the particular constructional features, as such, needed to form the claimed annular gas supply chamber in the meaning of the opposed European patent, let alone did he present an indication or suggestion that by such an annular chamber the pump speed could be increased.
- 5.5 Since, in the opinion of the Board, no hint can be found in the available prior art documents to provide a high-vacuum molecular pump with the specifically defined annular gas supply chamber as claimed, to solve the problem set out in above point 5.1, the subject-matter set forth in Claim 1 involves an inventive step within the meaning of Article 56 EPC.
6. The subject-matter of Claim 1 is, therefore, patentable within the meaning of Article 52 EPC, so that the patent can be maintained with the present Claim 1 and Claims 2 and 3 which are dependent thereupon.

7. The Appellant chose not to avail himself of the opportunity to take part in the oral proceedings. A communication under Rule 58(4) EPC is unnecessary in the present case (see Decision T 219/83, OJ EPO 1986, 211) since the oral proceedings gave the Respondent and also the Appellant - had he been present - adequate opportunity to comment therein on the current set of amended patent documents i.e. on the proposal to maintain the European patent in amended form.

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 maintain the patent with the documents set out in section X above.

The Registrar:



N. Maslin

The Chairman:


C. Andries