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D E C I S I O N
of 29 November 2000

Case Number: T 0327/99 - 3.2.1

Application Number: 92203111.7

Publication Number: 0538934

IPC: F16J 15/20

Language of the proceedings: EN

Title of invention:
Sealing rings for sliding units operating at very low temperatures

Patentee:
CESARE BONETTI S.p.A.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0327/99 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 29 November 2000

Appellant: (Proprietor of the patent)
CESARE BONETTI S.p.A
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Garbagnate Milanese
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Representative:
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 17 March 1999 revoking European patent No. 0 538 934 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: F. Gumbel
Members: S. Crane
J. van Moer

Summary of Facts and Submissions

I. European patent No. 0 538 934, granted on 24 April 1996 on the basis of European patent application No. 92 203 111.7, was revoked by the opposition division with its decision posted on 29 January 1999.

The reasons given for the decision were that the subject-matter of the single claim of the main request under consideration lacked novelty with respect to (D10) IT-A-12 29021 (with English translation) and that the single claim of the auxiliary request contained added subject-matter in contravention of Article 123(2) EPC.

II. A notice of appeal against this decision was filed on 26 March 1999 and the fee for appeal paid at the same time.

The statement of grounds of appeal was filed on 7 June 1999. With this statement the appellants (proprietors of the patent) submitted amended claims according to a main and an auxiliary request and proposed amendments to the description.

III. The only remaining opponents withdrew their opposition by letter received on 5 October 1999.

IV. Following a communication from the Board dated 20 July 2000 the appellants submitted on 22 September 2000 a new single claim as a main request. On 15 November 2000 the appellants agreed various editorial amendments to this claim and the description. The amended claim reads as follows:

"Seal assembly for sliding shafts or pistons operating at very low temperatures and high pressures wherein the only sealing elements of the seal assembly are sealing rings (1) each consisting solely of alternating graphite rings (1a) and supporting metal rings (1b) with graphite rings forming the outer layers of the sealing rings, the thickness of the graphite rings (1a) being between 0,5 to 1,5 mm and the thickness of the metal rings (1b) being between 0,01 to 0,03 mm, so that the contact with the sealing surface is made by the graphite rings (1a)."

V. In support of their request for maintenance of the patent in amended form the appellants argued that the sealing arrangement disclosed in document D10, which required a particular sequence of laminated graphite-metal foil sealing rings, reinforcing rings of a thickness of 1-5 mm and pure graphite sealing rings was suitable for use at the high temperatures for which it was specifically designed, but did not perform satisfactorily at very low temperatures. The appellants had found that this problem could be solved by using only sealing rings of the laminated graphite-metal foil material.

Reasons for the Decision

1. The appeal complies with the formal requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC. It is therefore admissible.

2. The claimed invention is concerned with a seal assembly for forming a sliding seal for shafts or pistons operating at very low temperatures and high pressures.

The seal assembly utilizes a sealing material, known *per se* from for example document D10, which consists of alternating layers of graphite of a thickness of 0.5 to 1.5 mm and a thin metal sheet or foil of a thickness of 0.01 to 0.03 mm. The outer layers of the material are of graphite; in use the sliding surface which is sealed against is contacted by the edges of the graphite layers.

The present claim now requires that the only sealing elements of the seal assembly are sealing rings consisting solely of the graphite-metal foil laminate mentioned above. There is a clear basis for this restriction in the original disclosure, both of the disclosed preferred embodiments conforming to what is stated in the claim. (The spacer 2 of the embodiment of Figures 1 and 2 is not a "sealing element" within the meaning of the claim, i.e. it has no direct sealing function). The claim therefore does not offend against Article 123(2) EPC. There is also no objection under Article 123(3) EPC as the present claim, requiring a plurality of sealing rings of a certain form in a seal assembly, is more restricted than the granted claim, directed to one of those sealing rings *per se*.

Document D10, on which the Opposition Division based its finding of lack of novelty against the claim of the main request then under consideration, relates to a sealing ring for sliding members operating at high temperatures and pressures. The sealing ring comprises an assembly of layers of laminated graphite-metal foil material (thickness of graphite layers about 0.7 mm, thickness of metal foil about 0.01 mm) reinforced by one or preferably more metal sheets of thickness of about 0.2 mm. A number of such sealing rings may be

combined to form a seal assembly. As can be seen from the introductory description and claims of document D10 the metal reinforcing sheets are integral and essential elements of the sealing rings so that these known rings do not meet the requirement of the present claim under consideration that they consist solely of the laminated graphite-metal foil material. The subject-matter of the claim is therefore novel with respect to document D10 (Article 54 EPC).

The Board has also satisfied itself that the same is true with respect to (D5) "Konstruktion 40", 1988, pages 179 to 181, the only other prior art document which played any role at the oral proceedings before the Opposition Division.

As for the question of inventive step, document D10 clearly represents the closest state of the art. The Board can find nothing which could have encouraged the person skilled in the art to dispense with the metal reinforcing sheets specifically taught by that document, in order for him to adapt the known high temperature sealing assembly to use at low temperatures. The subject-matter of the claims cannot therefore be derived in an obvious manner from the state of the art and accordingly involves an inventive step (Article 56 EPC).

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 in amended form on the basis of the following documents:

   Single claim (main request) filed on 22 September 2000 with letter of same date; amended as agreed by telephone on 15 November 2000;

   Columns 1 to 4 of the description as granted with the amendments set out in the annex ("main request") to the statement of grounds of appeal; further amended as agreed by telephone on 15 November 2000;

   Figures 1 to 3 of the drawings as granted.

The Registrar: The Chairman:

S. Fabiani F. Gumbel