BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen
(D) [ ] No distribution

D E C I S I O N
of 9 October 2001

Case Number: T 1056/99 - 3.2.1

Application Number: 93307501.2

Publication Number: 0590867

IPC: B63H 5/12, B63H 25/42, B63H 23/24, H02K 5/20

Language of the proceedings: EN

Title of invention:
Ship Propulsion arrangement

Patentee:
ABB Azipod Oy

Opponent:
STN ATLAS Elektronik GmbH
Rolls-Royce AB

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1056/99 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 9 October 2001

Appellant: (Opponent 02)
Rolls-Royce AB
Box 1010
S-681 29 Kristinehamn (SE)

Representative:
Nyberg, Bengt
Dr Ludwig Brann Patentbyra AB
P.O Box 17192
S-104 62 Stockholm (SE)

Respondent: (Proprietor of the patent)
ABB Azipod Oy
Laivanrakentajantie 2
Fin-00980 Helsinki (FIN)

Representative:
Newby, John Ross
JY & GW Johnson
Kingsbourne House
229-231 High Holborn
London WC1V 7DP (GB)

Other party: (Opponent 01)
STN ATLAS Elektronic GmbH
Sebaldsbrücker Heerstr. 235
D-28309 Bremen (DE)

Representative:
Schulz, Klaus, Patentassessor, Dipl.-Ing.
c/o STN ATLAS Electronik GmbH
Patentabteilung
D-28305 Bremen (DE)

Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 24 September 1999 concerning maintenance of European patent No. 0 590 867 in amended form.**

Composition of the Board:

Chairman: F. Gumbel
Members: S. Crane
H. Preglau

Summary of Facts and Submissions

I. European patent No. 0 590 867 was granted on 24 April 1996 on the basis of European patent application No. 93 307 501.2.

II. The granted patent was opposed by the present appellants (opponents 02) and the other party to the proceedings under Article 107 EPC (opponents 01). They requested revocation of the patent in its entirety on the grounds that its subject-matter lacked novelty and/or inventive step (Article 100(a) EPC).

The main citation relied upon was a brochure published by the legal predecessor of the present respondents (proprietors of the patent) and a partner company, entitled "Azipod" (document D1).

The appellants also relied on an alleged oral disclosure in a discourse by an employee (Mr Salmi) of the respondents which took place at the "Laradi Summer Days" meeting in Finland on 17 August 1992. As evidence of this they submitted declarations of two of their employees (Messrs Järvinen and Savikurki) who attended the discourse. The declaration of Mr Järvinen has been designated as document D16. It was accompanied by three annexes, the first of which was the "Azipod" brochure mentioned above, the second a summary of the discourse distributed at the meeting and third (designated in the proceedings as document D9) an internal report of Mr Järvinen concerning the discourse.

A large number of other prior art documents were also filed variously by the appellants, other party and respondents in support of their arguments. Of these

only the following have played any significant role in the appeal proceedings:

(D2) ABB Technik 1/89 "Generatoren"

(D3) GL Technische Liste SG 1 d/e, 1987, "Three-phase synchronous Alterator"

(D10) "Podded Destroyer Propulsion", Naval Engineers Journal, April 1979

(D11) F1-A-76 977 (together with its Canadian equivalent (D17) CA-C- 1 311 657, which was not pre-published).

III. With its decision posted on 24 September 1999 the Opposition Division held that the patent could be maintained in amended form on the basis of a claim 1 which reads as follows:

"A main propulsion unit (1) of a high power ship or other large marine vessel comprising an outer casing (1a) defining a tubular shaft (8) turnable about an axis substantially normal to the water surface and a bulbous lower portion (1b) connected to and turnable together with the tubular shaft (8), said casing (1a) defining in the bulbous portion (1b) an internal space containing an electrical drive motor (2) and a propeller shaft (3) connected to at least one propeller (4) external of the outer casing (1a), the outer casing (1a) being on its inside, supported by a plurality of web plates (5),which are arranged to act, simultaneously, as structural elements stiffening and supporting the outer casing (1a), as elements securing the drive motor (2) in place and transmitting to the

casing (1a) reaction forces to the torque developed by the drive motor (2) **characterised in that** the web plates also act as wall elements of ducts for incoming and outgoing gaseous coolant for the drive motor, whereby a part of the gaseous coolant is led through a duct (6a) for incoming gaseous coolant, into the gap between the stator and the rotor of the drive motor and out into a duct (6b) for outgoing gaseous coolant".

Dependent claims 2 to 12 relate to preferred embodiments of the propulsion unit according to claim 1. Claim 13 is directed to a rudderless marine vessel incorporating a propulsion unit as claimed in one of claims 1 to 12.

IV. A notice of appeal against this decision was filed on 23 November 1999 and the fee for appeal paid at the same time. The statement of grounds of appeal was submitted on 24 January 2000.

V. Oral proceedings before the Board were held on 9 October 2001. The other party to the proceedings, who had been duly summoned, did not attend. In accordance with Rule 71(2) EPC the oral proceedings were continued without them.

The appellants requested that the decision under appeal be set aside and the patent revoked in its entirety.

The respondent requested that the appeal be dismissed and the decision of Opposition Division confirmed (main request) or in the alternative that the patent be maintained on the basis of the further amended claim 1 filed with their letter of 20 July 2000.

At the oral proceedings the Board informed the parties that pursuant to Article 114(2) EPC it intended to disregard the additional evidence submitted by the appellants in the course of the appeal proceedings, with the exception of the following pre-published documents:

(A). The Motor Ship, June 1987, pages XIX-XX, XXII, article "Powerful currents drive the Queen", and page XXIII, advertisement by GEC Electrical Projects Limited.

(B). McGraw-Hill Encyclopedia of Science and Technology, McGraw-Hill, Inc. 1977, pages 502 to 503, article "Electric rotating machinery", section "Ventilation".

(C4). A.C. Hardy, Modern Marine Engineering, Volume III, London, 1948, Chapter 4 (pages 43 to 67).

VI. The arguments presented by the appellants can be summarised as follows:

From an inspection of document D1 it would be obvious to the person skilled in the art that the drive motor of the propulsion unit disclosed there was gas cooled, as was wholly conventional with large electrical machines cf. the documents D2, D3, A and C4. Furthermore, it was clear from those documents that it was also conventional to direct at least a part of the gaseous coolant into the gap between the stator and rotor of the drive motor. As far as arranging the flow of gaseous coolant to the drive motor was concerned the person skilled in the art would also recognise from the drawing at the top of page 3 of document D1 that the web plates shown there formed ducts which would be eminently suitable for this purpose.

If there were any doubts as to how the drive motor of document D1 was cooled then these had been eliminated by the discourse forming the subject of documents D16 and D9. In response to questions the speaker had clearly indicated that the drive motor was cooled by air, as was apparent from his use of the term "ventilation" cf. document B.

VII. In reply the respondents put forward essentially the following:

Document D1 was an advertising brochure with only limited detailed technical content. There was nothing in it which indicated gas cooling of the drive motor and in the circumstances this is not what the person skilled in the art would expect. In all of the cited documents related to comparable propulsion units where cooling of the drive motor was specifically mentioned, then this was by way of a liquid coolant, see for example documents D10 and D11/D17.

It had not been adequately proven that the speaker at the 1992 Laradi Summer Days had disclosed that the drive motor was gas cooled but even if he had, he had certainly made no disclosure of the specific means employed for doing this , as defined in claim 1, which were distinctly different from the enclosed arrangements disclosed in the documents relied upon by the appellants.

Reasons for the Decision

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

therefore admissible.

2. Document D1 does not carry a date but there is a wealth of extraneous evidence that it was widely distributed before the priority date of the contested patent and it has never been disputed by the respondents that it forms part of the state of the art. As such present claim 1 was reformulated during the opposition proceedings to reflect this prior art in its preamble.

The preamble of the claim defines an azimuthing podded propulsion unit (hence the name "Azipod") for a large marine vessel. The unit comprises an outer casing having a tubular shaft turnable about a vertical axis and a bulbous lower portion ("pod") which contains an electrical drive motor and a propeller shaft connected to a propeller external of the outer casing. The outer casing is supported by a plurality of internal web plates which also act as elements securing the drive motor in place. It is accepted that such web plates can be unambiguously derived from the graphic illustration of the unit on page 1 and the drawing of the top of page 3 of document D1.

In the characterising clause of the claim it is set out that the web plates also act as wall elements of ducts for incoming and outgoing gaseous coolant for the drive motor. A part of the gaseous coolant is led through a duct for incoming coolant to the gap between the rotor and the stator of the drive motor and out into a duct for outgoing coolant.

Although the appellants concede that there is no explicit disclosure in document D1 that the drive motor is cooled by a gaseous coolant they argue that the

document contains a number of indications which would make this implicit or at least obvious to the person skilled in the art. In particular, they point to the spacing around the stator of the drive motor, which would only make sense if there was gas cooling, and the absence of ducts or the like which would be necessary for the conduction of a liquid coolant if such were used. The Board cannot accept this interpretation of document D1, which in Board's view is wholly neutral as to the means employed for cooling the drive motor. The person skilled in the art will know that gas cooling of large electrical machines is commonplace, as evidenced by the documents D2, D3, A and C4, but on the other hand document D1 does not show any of the equipment normally associated with gas cooling, e.g fans, enclosures for the coolant, heat exchangers. He will however also know that in previous proposals for azimuthing podded propulsion units, eg documents D10 and D11/D17, it was specifically liquid cooling of the drive motor that was provided.

It is therefore necessary to consider what information concerning the cooling of the drive motor may have been disclosed orally at the "Laradi Summer Days" in August 1992. This is an annual meeting organised by a Finnish society of naval architects which is also open to non-members. It is not in dispute that a discourse was held by Mr Salmi, an employee of the legal predecessors of the respondents, and that copies of document D1 and a summary of the discourse prepared by Mr Salmi (annex 2 to document D16) were made available to the audience. It is not in dispute that an oral disclosure made by Mr Salmi would belong to the state of the art, insofar as it can be adequately proven.

It is to be noted in the first place that the summary of the discourse contains no indication that the cooling of the drive motor was included as a topic. However, in the declaration of Mr Järvinen (document D16) it is indicated that questions were asked by himself and other members of the audience concerning the cooling aspect and that the speaker stated that conventional ventilation was used. In this context the declaration, made in 1998, refers to annex 2, (document D9) a report made by Mr Järvinen for distribution to colleagues shortly after the date of the discourse. The report includes the summary of a question and answer session based on the discourse. The appellants place particular emphasis on question 2 at the top of page 3: "how is the ventilation provided for ?" Reply: "In the normal manner for the ventilation of a propeller motor". (In his declaration Mr Järvinen says this question was asked by his colleague Mr Savikurki, it is not however included under Mr Savikurki's questions in document D9.) The appellants argue, referring for example to document B, that in the given context the term "ventilation" would clearly be understood as meaning cooling. The Board notes, however, that in the reported reply to Mr Järvinen's third question the term "ventilation" is clearly used in another sense: "To fight condensation the ventilation is normal and the pod is kept at a predetermined temperature when it it not in operation". In his declaration Mr Järninen states that he asked a question about the feasibility of getting enough air to the motor. He gives no indication of what the reply might have been and given that this question does not feature among the three of his questions listed in document D9 this part of his evidence is of doubtful reliability and has perhaps become coloured by the

passage of time.

Although the Board accepts that the term "ventilation" is used in the art in the connection with the cooling of electrical machines, see for example document B, there remains in its view significant uncertainty as to whether the audience at the discourse of Mr Salmi was clearly informed by virtue of the question and answer session that the drive motor of the "Azipod" propulsion unit was gas cooled, especially having regard to the fact that "ventilation" of the interior of the pod in its more general sense was also a topic of discussion. In any case, as will be seen from what is said below, a different finding in this respect would not have led to a different conclusion on the fate of the patent.

3. Starting from the very general proposal of document D1 the person skilled in the art would need to take a number of engineering decisions before arriving at a practical embodiment. One of these decisions would concern the cooling of the drive motor. As the respondents have pointed out, none of the prior art literature on file concerned with podded propulsion units proposes gas cooling. Nevertheless, given that this technique is commonly employed with large electrical machines, cf. documents D2, D3, A and C4, the Board sees no reason why the person skilled in the art would exclude it from consideration. However each of those documents shows the electrical machine within an enclosure with drive fans provided for the circulation of the coolant in a closed circuit comprising a heat exchanger. There is nothing in the state of the art which is comparable with the way in which, as claimed, structural web plates form ducts for incoming and outgoing gaseous coolant. The attempt of

the appellants to draw such a hint from the schematic cross-section on page 3 of document D1, relying there on details which are scarcely visible to the naked eye, is based on hindsight knowledge of the invention and ignores the fact that the document is merely intended as advertising material and would not be seen by the person skilled in the art as a potential source of detailed technical information. Equally unacceptable to the Board is the contention of the appellants that the person skilled in art would immediately recognise the possibility of using the spaces between the web plates as ducts for flows of gaseous coolant. As pointed out by the respondents, web plates of the type involved are generally of open structure to reduce weight and material costs and would thus be unsuitable for defining wall elements of ducts.

Lastly, the fact that in the embodiment of Figure 6 the outer casing forms an enclosure incorporating a heat exchanger does not detract from the above analysis, since the web plates are still used, in the same way as in the embodiments with an open system, to define ducts for the flows of coolant.

The Board therefore comes to the conclusion that the subject-matter of claim 1 involves an inventive step.

Order

For these reasons it is decided that:

1. The appeal is dismissed.

The Registrar: The chairman:

S. Fabiani G. Gumbel