DECISION
of 9 October 2002

Case Number: T 0050/99 - 3.2.4
Application Number: 91308099.0
Publication Number: 0481598
IPC: F04D 7/04

Language of the proceedings: EN

Title of invention:
Centrifugal pump with sealing means

Patentee:
SULZER PUMPEN AG

Opponent:
Kvaerner Pulping AB

Headword:
-

Relevant legal provisions:
EPC Art. 52, 54(1)
R. 93(d)

Keyword:
"Novelty - yes"

Decisions cited:
-

Catchword:
-
Case Number: T 0050/99 - 3.2.4

DECISION
of the Technical Board of Appeal 3.2.4
of 9 October 2002

Appellant: Kvaerner Pulping AB
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Representative: Harrison, Michael Charles
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Respondent: SULZER PUMPEN AG
(Proprietor of the patent) Zürcherstrasse 12
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Representative: HOFFMANN - EITLE
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Decision under appeal: Decision of the Opposition Division of the European Patent Office posted 13 November 1998 rejecting the opposition filed against European patent No. 0 481 598 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: C. A. J. Andries
Members: M. G. Hatherly
H. Preglau
P. Petti
C. Holtz
Summary of Facts and Submissions

I. The opposition division's decision to reject the opposition against European patent No. 0 481 598 was posted on 13 November 1998.

On 12 January 1999 the appellant (opponent) filed an appeal and simultaneously paid the appeal fee, filing the statement of grounds on 17 March 1999.

II. By letter of 11 September 2002 the respondent (proprietor) filed new sets of claims for a main request and first and second auxiliary requests.

The sole independent claim 1 of the main request reads:

"A centrifugal pump for pumping a gas-containing medium said pump including:

a centrifugal pumping housing (50) having an inlet (52) and an outlet for said medium;

a centrifugal impeller (60) within said centrifugal pumping housing (50);

a liquid ring vacuum pump (70) adjacent said centrifugal pumping housing (50) said vacuum pump including a vacuum pump chamber (76) defined by first and second opposed side walls (112, 110) spaced apart by a circumferential annular wall (100);

a vacuum pump rotor (96) eccentrically positioned within said vacuum pump chamber (76), said rotor having outwardly extending opposed side edges facing said vacuum pump side walls (112, 110) and forming a clearance there between;

a rotary shaft (58) extending through said vacuum pump chamber and into said centrifugal pump housing (50);

said centrifugal pump impeller and said vacuum pump rotor being mounted on said shaft in spaced
III. The following documents played a role in the appeal proceedings:

D1: Drawing No. 12819-90, sheets 1 and 2, "MC-pump MCP 25/10", Kamyr AB

D2: Drawing No. 22820-163, "Mechanical seal unit, MCP 25/10, 25/15", Kamyr AB

D3: Drawing No. 12820-236, sheets 1 and 2, "Back wall, MCP 25/10...../15", Kamyr AB


D5: "Reference list - Medium consistency pumps L121E", Kvaerner Pulping, 1 November 1994

D6: Declaration by Mr Ulf Jansson dated 29 January 1997

D7: Declaration by Mr Ulf Jansson dated 10 March 1998

D8: Two photographs taken at Nymölla AB on 22 January 1998

D10: Brochure "MC® Pump - Kamy - Kvaerner"
Ref. 243E:1, six pages

D11: Declaration by Mrs Kerstin Nilsson dated 12 March 1998

D12: Pages 13 and 14 of D36 listed below


D15: Declaration by Mr Samppa Ahtiainen dated 5 October 1998

D16-1: Orders and invoices concerning a sale by Kamyr AB to Nymölla AB (in Swedish with English translation)

D16-2: Order confirmation by Kamyr AB to Södra Skogsägarna AB, Värö Bruk, dated 29 December 1989 (in Swedish with English translation)

D17: Invoice No. 52655 dated 14 March 1990 (in Swedish with English translation)

D18: Invoice No. 53629 from Kamyr AB to Södra Skogsägarna AB, Värö Bruk, concerning reserve parts, dated 13 September 1990 (in Swedish with English translation)
D19: Auditing/receipt form Götabanken to Kamyr AB for payment by Södra Skogsägarna AB, Vårö Bruk, dated 17 April 1990 (in Swedish with English translation)

D20: Register of documents delivered to Vårö Bruk (in Swedish with English translation)


D23: "Spare parts and price regulation", Södra Skogsägarna AB, Vårö Bruk, Annex 13, Contract 481.00, two pages (in Swedish with English translation)

D24: Drawing No. 12819-100, sheet 1 of 2, "MC-Pump, MCP 30/20", Kamyr AB

D25: Drawing No. 12820-252, sheet 1 of 2, "Back Wall, MCP 30/20", Kamyr AB

D26: Drawing No. 12820-252, sheet 2 of 2, "Back Wall, MCP 30/20", Kamyr AB

D27: Drawing No. 22820-164, "Mechanical seal unit, MCP 30/20", Kamyr AB

D28: Drawing No. 12820-144, sheet 1 of 3, "Casing, MCP-0/20", Kamyr AB

D29: Drawing No. 12820-144, sheet 2 of 3, "Casing, MCP 30/20", Kamyr AB
D30: Drawing No. 12820-144, sheet 3 of 3, "Casing, MCP-30/20", Kamyr AB

D31: Drawing No. 22820-156, "Impeller, degassing, MCP 30/20", Kamyr AB

D32: Drawing No. 12820-253, "Inner cover, MCP 30/20", Kamyr AB

D33: Drawing No. 12819-100, "MC-Pump, MCP 30/20", Kamyr AB

D34: Marked up enlargement of part of the above listed D24 (filed by the appellant)

D34(R): Marked up and modified copy of part of the above listed D34 (filed by the respondent)


D37: Mr Ulf Jansson's travel documents and hotel receipt counter slip, for Vårö Bruk

D38: Quality documentation concerning manufacture of three MCP 30/20 pumps, dated June 1989

D39: Drawing No. 10101-1472, flow chart at Vårö Bruk, Kamyr AB
IV. The appellant and the respondent (proprietor) attended oral proceedings on 9 October 2002.

In the appeal proceedings the appellant argued essentially that the claimed pump was not novel over two alleged public prior uses. The respondent countered the appellant's arguments.

V. The appellant requested that the decision under appeal be set aside and the European patent be revoked.

The appellant further requested that the contract D21 (original and translation) should be kept in the non-public part of the file, for commercial reasons.

The respondent requested that the decision under appeal be set aside and the patent be maintained on the basis of the following:

- Claims 1 to 14 of the main request, alternatively claims 1 to 14 of the first auxiliary request, or claims 1 to 11 of the second auxiliary request, all filed with the letter of 11 September 2002 and a description to be adapted.
Reasons for the decision

1. **Admissibility**

   The respondent's objection to the admissibility of the opposition was not maintained in the oral proceedings.

   The appeal is admissible.

2. **Amendments - the main request**

2.1 The sole change in wording between claim 1 as granted and claim 1 of the main request is from

- "means for supplying sealing liquid to said clearance (122) between said rotor and at least one of said side walls (112, 110) of said vacuum pump chamber (76)"

   to

- "means for supplying sealing liquid to a clearance (122) between said rotor and at least the first side wall (112) of said vacuum pump chamber (76) closer to the centrifugal impeller (60)".

2.1.1 The clearances being discussed can be seen from Figure 3 of the patent to be

- the clearance between the rotor (96) and the side wall (112) of the vacuum pump chamber (76) closer to the centrifugal impeller (60), and

- the clearance between the rotor (96) and the side wall (110) of the vacuum pump chamber (76) further from the centrifugal impeller (60).
2.1.2 Claim 1 of the main request now specifies means for supplying sealing liquid

- either only to the clearance at the side wall (112),

- or to the clearance at the side wall (112) and the clearance at the side wall (110).

2.1.3 The appellant maintains that, while there is a basis in the patent as granted for supplying sealing liquid to both clearances, there is no basis for supplying sealing liquid only to the clearance at the side wall (112).

2.1.4 However claim 1 as granted refers to "at least one of said side walls (112, 110)" and thus quotes the reference numerals for each side wall. Therefore the Board considers that it is clear to the reader that either side wall (112) or side wall (110) or both side walls (112) and (110) are meant. Claim 1 as granted is in effect three claims, the first supplying liquid to the clearance at the side wall (112), the second supplying liquid to the clearance at the side wall (110), and the third supplying liquid to both the clearance at the side wall (112) and the clearance at the side wall (110). Claim 1 of the main request is now restricted to the first and the third of these alternatives, so that neither an extension of subject-matter (Article 123(2) EPC) nor an extension of protection (Article 123(3) EPC) has occurred.

2.2 The dependent claims of the main request are essentially the same as those as granted except where the side walls have been renamed the first and second side walls, in line with claim 1 of the main request.
The description of the main request is the same as that granted except where it has been brought into line with claim 1 of the main request.

The drawings remain as granted.

Thus there is no objection under Article 123 EPC to the version of the patent according to the main request.

Preliminary remarks on the clearances in claim 1 of the main request

Claim 1 of the main request specifies "means for supplying sealing liquid to a clearance (122) between said rotor and at least the first side wall (112) of said vacuum pump chamber (76)". It can be seen in Figure 3 of the present patent that the supply from the connection port (116) via the duct (120) enters the vacuum pump chamber via a clearance between the pump side wall and the central portion (102) of the rotor (96). Similarly the groove (132) for providing sealing liquid in Figure 4 is located in the central portion (102) of the core. On the other hand, the inlet (94) in each of Figures 3 and 4 is located outside the core central portion (102), this inlet is swept over by the vanes of the rotor so that the inlet is either open to the space between vanes or temporarily partly covered by a passing vane. The Board does not consider that anything entering via inlet (94) could be said to be entering a "clearance" which implies a narrow gap between two things, a gap which exists and continues to exist.
3.2 From now on in this decision, for conciseness

- the clearance between the rotor (96) and the first side wall (112) of the vacuum pump chamber (76) closer to the centrifugal impeller (60) will be termed the first clearance, and

- the clearance between the rotor (96) and the second side wall (110) of the vacuum pump chamber (76) further from the centrifugal impeller (60) will be termed the second clearance.

3.3 Much of the appellant's argumentation prior to the appellant's filing of the present main request concerned supplying sealing liquid to the second clearance.

Claim 1 of the main request specifies supplying either only the first clearance or both the first and second clearances. Therefore, as far as the main request is concerned, it is decisive whether supplying the first clearance is new or obvious. Accordingly, arguments regarding supplying the second clearance are prima facie not relevant for the main request unless e.g. they shed some light on the circumstances of the alleged prior uses.

4. Novelty - claim 1 of the main request - first allegation of public prior use - Nymölla

4.1 The appellant maintains, citing documents D1 to D13, D15 and D16-1, that the subject-matter of claim 1 of the main request is not novel in view of a delivery by Kamyr AB to Nymölla AB, Nymölla of an MCP 25/10 pump in 1989 (henceforth referred to as the Nymölla pump).
4.2 The list D5 is not prior art and whom it was intended for is not stated. However it lists deliveries of various sorts of MC pumps, some of them MCP 25/10 pumps, before the priority date. Page 17 at the top specifies a delivery of an MCP 25/10 pump to Nymölla in 1989. D16-1 is a collection of orders and invoices concerning a sale by Kamyr to Nymölla.

While the Board and respondent accept that something was sold to Nymölla, and the appellant has done his best to provide information as to what it was, there remain inconsistencies and gaps in the proof offered.

Most of the drawings filed to support the Nymölla allegation of public prior use have been revised after the priority date and all are marked "confidential".

The drawing D2 plainly does not correspond to the Nymölla pump since the appellant consistently stated that the Nymölla pump had a stuffing box seal not mechanical sealing.

In D7 Mr Jansson states that the "pump was produced by Ahlström" which is also what is stated in the machine register D9. However Mr Ahtiainen denies this in D15 and even Mr Jansson stated in the taking of evidence before the opposition division (see page 1 of the minutes) that "I wish to clarify that MCP pumps were never manufactured as such by the patentee" and (see page 5 of the minutes, fifth paragraph) that "To the question ... whether I have ever seen an Ahlström MCV pump or an Ahlström pump with internal degasing, my answer is no". The machine register D9 for the Nymölla pump indicates "Coll. draw.: 12819-90" which is drawing D1. However D1 shows a mechanical seal whereas the Nymölla pump is said to have a stuffing box.
Although page 5 of the brochure D10 (stated in D11 to be public prior art) is said to show "the same installation as shown from Nymölla", only external connections are shown whereas the discussion below in sections 4.7 to 4.10 shows that knowledge of the interior of the Nymölla pump is needed. The photographs of D8 are of no more help and anyway were taken long after the priority date.

The origin of D14 (cited by the proprietor) and its relevance to the Nymölla pump has not been proven and so this document is disregarded.

It is up to the appellant (opponent) to prove his case and provide a logical and sufficiently strong chain of proof relating to the alleged public prior use at Nymölla. If this is not done, then the allegation fails.

Nevertheless, despite having doubts as to the precise construction of the Nymölla pump, the Board will now proceed on the hypothesis that the evidence essentially does relate to the Nymölla pump, in order to see what the consequences for the argument of lack of novelty would be.

4.3 Sheet 1 of D1 shows a duct through a back wall (4) to a passage in an inner cover (5). It follows from the marking "0,4" that there is a gap between the right-hand wall of the inner cover (5) and the side edges of the vanes of the vacuum pump rotor.

However neither sheet of D1 discloses what passes through this duct and whether and, if so, where the passage communicates with the vacuum pump chamber.
4.4 D2 shows a mechanical seal and so is irrelevant to the Nymölla pump which is said to have a stuffing box seal. D3 concerns the side of the vacuum pump chamber further from the centrifugal impeller and so does not help to explain the situation at the first clearance.

4.5 D1 does not refer to D4 which is moreover entitled "MC-Pump" (i.e. medium consistency pump) whereas D1 concerns the more specific MCP pump which is an MC pump characterised by having a common drive shaft for the pump impeller and vacuum pump impeller. Further Mr Jansson states in D6 that D4 shows "a typical way of arranging the supply of the sealing liquid to such a pump" implying thereby that D4 does not show the only way. Therefore there it is not proven that D4 is the flow sheet for the D1 pump. Moreover, since D4 shows a connection "To mechanical seal" and the Nymölla pump is said to have a stuffing box, it is doubtful whether D4 is the precise flow sheet for the Nymölla pump.

4.6 Nevertheless the appellant argues essentially that the flow of 3 l/min of water from flowmeter 4B and the flow of air via valve (6) shown on D4 is fed to the first clearance in the Nymölla pump as illustrated (except for the stuffing box) by D1. Mr Jansson stated in the taking of evidence before the opposition division (see the bottom half of page 4 of the minutes) that "air is also supplied to the degasing chamber" and "water and air can flow together through the same pipe".

If this is correct, then it is still unclear where the passage in inner cover (5) (see D1) communicates with the vacuum pump chamber.
4.7 One sees the pump side wall and vacuum pump rotor in D1 in section at a single plane and so knows nothing about the situation in front of and behind this plane. The appellant has not filed the drawing of the inner cover (5) listed at the right of sheet 1 of D1 which could have answered this question. In the oral proceedings, he referred to D34 (an enlargement of D24 filed to support the second prior use allegation but similar to D1) marked up in red to show the flow entering the vacuum pump chamber between the pump side wall and a part of the core of the rotor and progressing radially outwards between the vane edges and the pump side wall.

However other documents on file place doubt on this version.

4.8 The appellant implied, by marking up the flow entering the vacuum chamber in D34 in red, that this is all the inlet flow. However D34 is an enlargement of D24 which states that the drawing for the inner cover (5) is 12820-253A. D32 is drawing number 12820-253 and is entitled inner cover. This inner cover has an arc shaped aperture (the aperture is marked with the outer radius "R92,5±0,4") for communication between the passage within the inner cover and the vacuum pump chamber. Thus, at least predominantly, the flow enters the vacuum pump chamber via this arc shaped aperture and not as marked up in D34. The true situation is more like what is shown in D34(R) which is a marked up and modified copy of D34, filed by the respondent during the oral proceedings.

Since the appellant maintains, see the last paragraph of page 4 of the letter of 28 February 2000 regarding the pump numbers MCP 25/10 (i.e. D1) and MCP-30/20 (i.e. D24) that "the only distinction between the different pump numbers, in all essential aspects,
resides in their size alone" then it must be assumed that the arrangement of the inlet to the vacuum chamber in the Nymölla pump is essentially the same as that shown by D32.

4.9 D36 was cited to support the second prior use allegation but was also discussed in the oral proceedings when considering the Nymölla pump. Page 15 of D36 shows schematically a similar pump to that of D1 and page 38 of D36 mentions MCP pumps. Page 16 of D36 says that air and flush water are supplied in the same conduit, see "Flush water is supplied in the same conduit in front of the vacuum wheel ...". D36 shows in the two diagrams at the top of the reverse side of page 15 how the passage around the shaft opens into the lower half-moon aperture marked "inlet". The inner boundary of this inlet coincides with the inner boundary of the vanes. As the rotor rotates, the vanes sweep over the inlet and so the air and water will enter the vacuum pump chamber principally into the spaces between the vanes themselves. There will be essentially no entry via the clearance between the pump side wall and the rotor because, as shown by the picture on the top left, in the spaces between the vanes themselves there is no rotor surface opposite the side wall for a clearance to be formed there between. Even where there are vanes there is no clearance because the vanes are opposite the half-moon aperture in the side wall.

4.10 The situation described in section 4.9 above should be compared with Figures 3 and 4 of the present patent where the supply enters via a true clearance between pump side wall and rotor, namely at the central
portion 102 of the rotor. What is provided in D32 and D36 is not considered by the Board to be means for supplying sealing liquid to the first clearance in the sense of claim 1 of the main request.

It is written in the above section 4.8 that, at least predominantly the flow enters the vacuum pump chamber via this arc shaped aperture and not as marked up in D34. The appellant argues that there is a flow as marked up in red on D34 between the pump side wall and a part of the core of the rotor to flush fibres through the vacuum pump but, even if there is a flow, the Board is not convinced that it is sufficient to provide sealing of the first clearance.

The Board also agrees with the statement of the opposition division in the last paragraph of section II.8 of its decision, that "owing to the fact that the liquid is mixed with air, it is not possible to assert that there will be no interruption in the film of sealing liquid and consequently, it is not possible to conclude that the Nymölla pump comprises means for supplying sealing liquid to the clearance between the rotor and the side wall of the vacuum pump chamber closer to the centrifugal impeller."

4.11 Accordingly the Board finds that, even if the alleged prior use at Nymölla of a precisely defined pump were accepted, it would not destroy the novelty of the subject-matter of claim 1 of the main request.

5. Novelty - claim 1 of the main request - second allegation of public prior use - Värö Bruk

5.1 The second allegation of public prior use by the appellant is that the subject-matter of claim 1 is not novel in view of a delivery by Kamyr AB to Södra Skogsågarna AB, Värö Bruk (henceforth Värö Bruk) of
pumps and their successful running prior to the priority date. This allegation relies on D1 to D7, D10, D11 and D16-2 to D41.

5.2 Order confirmation D16-2, dated 29 December 1989 is for a supplement No. 4 to a contract 481.00 quoting a price of SEK 85,741,000. Invoice D17 dated 14 March 1990 requests payment of 10% of the above sum "after completed problem-free test operation", which amount, according to D19 dated 12 April 1990, was duly paid, thus implying that the equipment had been run satisfactorily before the priority date.

D39 is a flow chart for Värö Bruk showing positions OW25, OW32 and OW46 but not stating which type of pump is installed there. However the number 10101-1472 of D39 differs from the numbers 40101-803, 30101-473C, and 10102-1661 to 1663 quoted in the first paragraph of page 1 of D22 which is the technical specification for Värö Bruk.

5.3 D23 is a price list for spare parts for pumps at the above positions and, according to D18, dated after the priority date, spare parts were supplied for an MCP 30/20 pump installed in position OW25 at Värö Bruk.

Mr Börjesson states in D41 that MCP 30/20 pumps were delivered to Värö Bruk in 1989, basing his statement on a binder comprising D35 and D36. However D35 does not specify the pump type and, while D36 mentions MCP pumps, it also mentions many alternatives of equipment (e.g. seals and different sizes of pumps) so that the Board cannot see it as a record of precisely what was supplied.

According to the quality documentation D38, three MCP 30/20 pumps were manufactured and "Värö" is mentioned under the "Project/Item No:"
5.4 However, this first argument is contradicted by the technical specification D22 of Vårö Bruk according to which the pump at each position OW 25 (page 2), OW 32 (page 4) and OW 46 (page 7) is unequivocally stated to be an "MC-pump MRU-20-P1", i.e. not an MCP 30/20 pump.

5.5 In the oral proceedings the appellant was unable to explain the inconsistencies between these two arguments, each leading to a different conclusion regarding which pumps (MRU-20-P1 or MCP 30/20) was installed at Vårö Bruk. It is not up to the Board to decide which of these mutually exclusive arguments based on mutually exclusive evidence might be correct.

5.6 D24 to D34 show an assembly or parts of an MCP 30/20 pump but, like D40, are not linked to Vårö Bruk. While the Board finds it plausible that such drawings would not be marked with the name of the final user, it means that their value is neutral, they neither help nor harm the appellant's case.

5.7 So the Board cannot conclude that an MCP pump was installed at Vårö Bruk.

Even it had been, the Board's reasoning in sections 4.6 to 4.10 would again apply, leading to the conclusion that an MCP pump at Vårö Bruk would not destroy the novelty of the subject-matter of claim 1 of the main request.

If on the other hand an MRU pump had been installed then this would have been a conventional pump (according to the middle of page 3 of D5 an MRU pump had been delivered as early as 1983) and would have been less relevant than an MCP pump.
5.8 Thus the Board does not find that the second alleged public prior use deprives the subject-matter of claim 1 of the main request of novelty.

6. Inventive step

The appellant's attack on the subject-matter of claim 1 of the main request was of lack of novelty relying on the two allegations of public prior use. In the appeal proceedings the appellant has not put forward any reasoning as to why, if the subject-matter of claim 1 of the main request should be found to be novel, then it would not be inventive.

The Board sees no logical and obvious way of proceeding from what the appellant has been able to prove to the claimed pump.

7. Thus the Board finds that the centrifugal pump defined by claim 1 of the main request is novel and inventive over the evidence presented. Thus claim 1 of the main request is patentable as are dependent claims 2 to 14.

8. Accordingly the patent can be maintained amended in the version according to the main request. Examination of the auxiliary request of the respondent is therefore unnecessary.

9. \textit{D21 - Rule 93(d) EPC}

The appellant has put forward plausible commercial reasons for keeping the contract D21 and its translation into English in the non-public part of the appeal file. The respondent does not object to this, and the decision of the Board on the appeal does not depend on the content of these documents. Therefore this request of the appellant can be granted.
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 following documents:

   Claims: 1 to 14 of the main request filed with letter of 11 September 2002,

   Description: columns 1 and 2 as granted, columns 3 and 4 as filed in the oral proceedings, and columns 5 to 7 as granted.

   Drawings: Figures 1 to 4 as granted.

3. The contract filed by the appellant as D21 and the translation into English thereof shall be kept in the non-public part of the appeal file.

The Registrar: The Chairman:

G. Magouliotis C. Andries