

Internal distribution code:

- (A) [] Publication in OJ
(B) [] To Chairmen and Members
(C) [X] To Chairmen

D E C I S I O N
of 12 January 1999

Case Number: T 0813/95 - 3.2.3

**International
Application Number:** PCT/SE 89/00138

**International
Publication Number:** WO-A-89/10793

IPC: B04B 1/00, B04 B 11/04

Language of the proceedings: EN

Title of invention:
Centrifugal separator with pumping means, arranged to
accomplish a circulating flow

Applicant:
ALFA-LAVA SEPARATION AB

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56, 84

Keyword:
"Clarity and inventive step (yes, after amendment)"

Decisions cited:
-

Catchword:
-



Europäisches
Patentamt

European
Patent Office

Office européen
des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Case Number: T 0813/95 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 12 January 1999

Appellant: ALFA-LAVAL SEPARATION AB
S - 14780 Tumba (SE)

Representative: Lerwill, John
A.A. Thornton & Co.
Northumberland House
303-306 High Holborn
London, WC1V 7LE (GB)

Decision under appeal: Decision of the Examining Division 2.3.13.100 of
the European Patent Office dated 31 March 1995
refusing European patent application
No. 89 904 658.5 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: C. T. Wilson
Members: F. Brösamle
J. P. Seitz

Summary of Facts of Submissions

I. The Appellant (Applicant) lodged an appeal on 23 May 1995 -paying the appeal fee on the same day- against the decision of the Examining Division of 31 March 1995 to refuse European application No. 89 904 658.5. The Statement of Grounds of Appeal was received on 1 August 1995 (Telefax).

The Examining Division had expressed the view that Claim 1 underlying its decision did not involve an inventive step as required under Articles 52(1) and 56 EPC and that this Claim 1 was also not allowable because it did not meet the requirements of Article 84 and Rules 29(1) and 29(3) EPC since it did not contain all the essential features, (see partitioning wall "44").

II. Following the Board's communication pursuant to Article 110(2) EPC in which the Board gave its provisional opinion on the issue of clarity of Claim 1 and asked for a revised description, the Appellant with letter of 5 November 1996, received on 7 November 1996, filed Claims 1 to 6 and a revised description and requested:

(a) to set aside the impugned decision and

(b) to grant a patent on the basis of

Claims 1 to 6, received on 7 November 1996;

Description: pages 1 to 2b, 3 to 10, received on 7 November 1996;

Drawings: sheets 1/2 and 2/2 with Figures 1 and 2 as originally filed.

III. Claim 1 reads as follows:

"1. Centrifugal separator for separation of solids from a liquid suspension, comprising a rotor (1, 18, 21, 22, 24, 44), that forms a separating chamber (7) having a central part and a peripheral part, means defining within the rotor a central chamber (26) and a channel (19b, 46, 27), communicating at one end with the central chamber (26) and at its opposite end with the peripheral part of the separating chamber (7), a first part (46, 27) of the channel close to the central chamber (26) extending substantially parallel with the rotor axis and a second part (19b) of the channel forming an angle with the rotor axis and extending from the first channel part (46, 27) to the peripheral part of the separating chamber (7), the centrifugal separator further comprising a pumping means (31) arranged during the operation of the rotor (1, 18, 21, 22, 24, 44) to pump liquid out of the central chamber (26) into a flow passage (25a, 45) formed in the rotor and opening at an area of said channel (19b, 46, 27) situated between the ends thereof to establish a recirculation of pumped liquid in a flow circuit comprising said flow passage (25a, 45), said first part (46, 27) of the channel, the central chamber (26) and the pumping means (31)."

IV. Appellant's essential arguments in view of the above requests can be summarized as follows:

- Claim 1 has been recast along the line of the Board's communication pursuant to Article 110(2) EPC so that it is believed that the requirements of Article 84 EPC now are met;
- the partition member is only a preferred embodiment of the invention since a recirculation of pumped liquid can be achieved by other means;

- such means are mentioned on originally filed page 4, line 6 to 13 or are formed by rotor parts "18, 21, 22 and 44" in one integral piece and by providing holes "25a, 45" to form the flow passage to convey liquid to the desired area of the channel "19b, 46" -reference signs according to Figures 1 and 2 of the application;
- the Appellant should therefore not be restricted to the partition member "44" in his Claim 1;
- (D1), namely US-A-4 622 029, teaches away from the subject-matter of Claim 1 since a counterflow within the meaning of Claim 1 is not realized and since (D1) is completely silent about the problem of sedimentation of solid particles and the related problem of clogging of a channel parallel to the rotor axis;
- in (D1) the problem of overcoming heating up of the liquid is dealt with;
- even if the solution laid down in (D1) is considered by a skilled person then only sedimentation of solid particles in a **radial** direction could be avoided i.e. in a passage where no tendency for deposits exists anyway;
- (D1) does not disclose a solution to the problem of how sedimentation in the chamber parallel to the rotor axis can be avoided; the through hole "20" according to Figure 1 of (D1) serves another purpose so that only by hindsight can the prior art be seen to point towards the invention defined in present Claim 1;

- under these circumstances the impugned decision cannot be upheld. Rather the patent is to be granted on the basis of documents according to above remark II b.

Reasons for the Decision

1. The appeal is admissible.
2. *Clarity*
 - 2.1 The Examining Division based its decision inter alia on objections under Article 84 and Rules 29(1) and (3) EPC.
 - 2.2 Following the suggestion of the Board, Claim 1 is drafted in a one-part form since the former two-part form was not appropriate in this case. In the present Claim 1 the reference signs and technical terms are used uniformly so that there is no longer an inconsistency in the claim in this respect.

The Board is also of the opinion that the partition member "44" is not an essential feature of Claim 1, as explained in paragraph 4.6.

- 2.3 Summarizing, Claim 1 is no longer open to an objection under Article 84 EPC.
3. *Novelty*

This issue needs no detailed arguments since the impugned decision is not based on an objection under Article 54 EPC. The Board shares these findings since Claim 1 has only been clarified without departing from the frame of Claim 1 underlying the impugned decision.

4. *Inventive step*

4.1 Nearest prior art is (D1) from which document a centrifugal separator can be seen, cf. its Figure 2, in which a recirculation takes place along the path according to reference signs "32-36-25-27-26" under the action of the paring disc "31" acting as a pump in order to bring down the relatively high temperatures arising in the central outlet chamber in use of the centrifugal separator i.e. maintaining the temperature within the outlet chamber which does not substantially exceed the temperature of the liquid being under treatment within the separating chamber of the rotor, see (D1) column 1, lines 24 to 47.

The above indicated path according to (D1) can be seen as a ring circulation without positively affecting the conditions in channel "19" according to its Figure 2, namely the problem of deposits of solid particles on the radially outer wall of said channel and of even blocking the liquid flow therethrough and to question thereby the function of separation.

4.2 Starting from a centrifugal separator according to (D1) the object of the present invention is to avoid collection of particles in the first (cylindrical) part of the channel -where there is a tendency for the solid particles to deposit under the influence of centrifugal forces.

4.3 The above object of the invention is solved with the features laid down in present Claim 1 leading to a **flow and a counterflow** in the region of the first part "46, 27" of the channel. Maintaining a constant flow in the

first (cylindrical) part of the channel counteracts the tendency of the solid particles to separate from the liquid and to deposit on the radially outer wall of the channel.

4.4 With this solution to the above object of the invention the problems of clogging and blocking the liquid flow in the channel are clearly solved, whereby the intended function of the centrifugal separator is no longer jeopardized.

4.5 With respect to the arrangement of passages according to (D1), (see above remark 4.1), it is evident that Claim 1 deals with the solution to a different problem i.e. with the problem of how an increase of temperature can be excluded. This is also the reason for the different solutions according to (D1), namely a simple ring circulation outside the **crucial cylindrical channel-area**, and to present Claim 1, namely provision of a **permanent flow** in the crucial cylindrical channel-area.

(D1) points therefore away from the claimed solution to the above object of the invention.

4.6 The Board is in full agreement with the Appellant that the **partition member "44"** is no essential feature of the invention so that Claim 1 need not be restricted to this feature.

The Appellant is right to point to **alternatives** to the partition member in this respect, namely by providing flow ways in the one and in the opposite direction, (see originally filed page 4, paragraph 2), or by forming the rotor parts "18, 21, 22 and 44" (reference

signs of the application in suit) in one integral piece and to provide holes "25a, 45" through this integral rotor part to form the flow passage to convey liquid to the desired area of the channel "19b, 46", (see Figure 2 of the application).

These findings are supported by the fact that originally filed Claim 1 **did not contain** the partition member "44". This feature was contained only in **dependent** Claims 3 to 6 as originally filed.

- 4.7 The statement of the Examining Division in the impugned decision, namely "recirculation is state of the art... and to specify recirculation in any place where sedimentation has been experienced is an obvious remedy" appears to be the result of inadmissible **hindsight** and not to be backed up by (D1) which document is completely silent about the problem of clogging of a channel parallel to the rotor axis.
- 4.8 Returning to (D1) the following has to be observed in this respect:

Even if the teaching of (D1) is seen as a means for overcoming sedimentation of solid particles it has to be observed that recirculation according to (D1) is only realised in a **radial** direction, i.e. in the passage "25", in which **there is no tendency for deposits** which could cause clogging. Rather, sedimentation is likely to occur in the chamber parallel to the rotor axis, namely in the **outside** wall of chamber "19b", see Figure 1 of (D1), due to the existence of centrifugal forces. In this critical area of a centrifugal separator, (D1) does **not** provide for recirculation so that a skilled person is not led to the teaching of Claim 1.

The through hole "20" according to column 2, lines 61 to 64 and column 4, lines 47 to 52 of (D1) obviously serves another purpose and is irrelevant for the aspect of recirculation to avoid sedimentation/clogging of solids, (see Appellant's letter of 4 October 1994, page 3, last paragraph).

- 4.9 Apart from (D1) only documents of "A-category" are cited in the Search Report. Since the Examining Division did not find any of these documents relevant, a finding with which the Board agrees, and since in principle the Examining Division before the point of issuing a negative decision **was positive**, (see its communications), it appears not necessary to consider these documents in detail. US-A-4 525 155 and 3 752 389 are dealt with in the opening of the application as originally filed and as filed on 7 November 1996.
- 4.10 Summarizing the above observations the Board is convinced that the prior art **without knowing the claimed invention** would not allow the skilled person to arrive at the centrifugal separator according to Claim 1 so that the requirements of Article 56 EPC are also met.
- 4.11 Claim 1 is consequently allowable; this is also true for dependent Claims 2 to 6 which concern further embodiments of the invention.
5. Since the revised description and the drawings meet the essential requirements of the EPC the application in suit is ready for grant.

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 grant a patent on the basis of documents set out above under paragraph II b.

The Registrar:



N. Maslin

The Chairman:



C. T. Wilson

