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Datasheet for the decision of 19 February 2010

Case Number: T 0826/07 - 3.3.06

Application Number: 96945242.4

Publication Number: 0954367

IPC: B01D 53/047

Language of the proceedings: EN

Title of invention:
Improved fluid fractionator and corresponding process

Patentees:
SeQual Technologies Inc., et al

Opponent:
Air products and chemicals, Inc.

Headword:
Home size oxygen concentrator / SEQUAL

Relevant legal provisions:
EPC Art. 123(2), 83, 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Amendments originally disclosed - main request (yes)"
"Sufficiency of disclosure - main request (yes)"
"Inventive step - main request (yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0826/07 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 19 February 2010

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 12 March 2007 revoking European patent No. 0954367 pursuant to Article 102(1) EPC 1973.**

Composition of the Board:

Chairman: P.-P. Bracke
Members: E. Bendl
J. Geschwind

Summary of Facts and Submissions

I. The appeal is against the decision of the Opposition Division to revoke the European patent 0 954 367.

II. In opposition procedure the Opponent argued that the requirements of Articles 54, 56, 123(2) EPC were not met and requested revocation of the patent. The Opposition Division decided, that the then pending main request and auxiliary requests I-III did not meet the requirement of Article 56 EPC.

III. The Proprietors, now Appellants, filed an appeal against this decision and submitted with the grounds of appeal a new main request and auxiliary requests I-III.

IV. The Opponent, now Respondent, argued that these requests would not meet the requirements of Articles 83, 123(2), 123(3) and 56 EPC and cited inter alia the following documents to support the argumentation:

D2 = English translation of JP-A-57-71804
D5 = GB-A-2 003 742
D8 = EP-A-0 266 051
D9 = US-A-5 268 021

V. In the oral proceedings before the Board, which took place on 19 February 2010, the Appellants filed an amended main request, consisting of nine claims, referred to as "amended claim set 1". As a reaction to this amendment the Respondent dropped his objection with regard to Article 123(3) EPC.

VI. The independent claims of this main request, on which the present decision is based, read as follows:

"1. Home size oxygen concentrator for removing oxygen from air and for providing for the flow such oxygen to a user at a prescribed rate, the concentrator comprising:

a plurality of columns (18) at least a first one of which adsorbs nitrogen and other components from the air and passes the oxygen in the air and at least a second one of which desorbs the nitrogen and other components previously adsorbed in such column;

a variable speed rotary valve assembly (21) for providing for the selection of the at least first one of the columns (18) in the plurality of columns (18) and the at least second one of the columns (18) in the plurality of columns (18) on a cyclic basis, the variable speed rotary valve assembly (21) having a speed that may be varied in accordance with flow characteristics of the compressor (13) to regulate air pressure in the columns (18);

a variable speed compressor (13) for receiving and compressing the air and for introducing the compressed air to the at least first one of the columns (18) in the plurality of columns (18) in accordance with the operation of the valve assembly (21), the variable speed compressor (13) having a speed that may be varied in accordance with oxygen flow rate desired;

a product tank (19) for collecting the oxygen passing through the at least first one of the columns (18) in the plurality of columns (18); and

a control (80) for directly adjusting the speed of the compressor (13) and the speed of the variable speed rotary valve assembly (21) to the prescribed flow rate

for the passage of the oxygen through the at least first one of the columns (18) in the plurality of columns (18)."

" 6. A method for removing oxygen from air and for providing for the flow of such oxygen to a user at a prescribed rate with a home size oxygen concentrator according to claim 1, the method comprising the steps of:

compressing the air with a variable speed compressor (13);

introducing the air into a plurality of columns (18) on a cyclic basis by a variable speed rotary valve assembly (21), wherein in a first one of the plurality of columns (18) nitrogen from the air is absorbed and the oxygen passes through, wherein in a second column of the plurality of columns (18) the nitrogen is desorbed;

collecting the oxygen in a product tank (19);

adjusting the flow rate of the oxygen by a control (80) for directly adjusting the speed of the variable speed compressor (13) in accordance with the oxygen flow rate desired; and

varying the speed of the variable speed rotary valve assembly (21) in accordance with flow characteristics of the variable speed compressor (13) to regulate fluid pressure in the plurality of columns (18)."

Claims 2 to 5 and 7 to 9 were dependent upon Claim 1, respectively Claim 6.

VII. **Respondent's** main arguments with regard to the main request were as follows:

Article 123(2) EPC

– The terms "home size oxygen concentrator" and "directly adjusting" have not been originally disclosed, since "home" has only been used in connection with prior art, but not in connection with the size of the apparatus. Also the direct adjustment of both, the compressor and the rotary valve assembly speed with control (80) cannot be found in the application as originally filed.

Article 83 EPC

– The term "home size oxygen concentrator" is vague and "unclear in violation of Art. 83 EPC". The only reference to "home size" in the patent-in-suit refers to energy consumption, but not to the size. At most the term means that the device can be used at home.

– It is not clear, what the expression "fluid pressure" in Claim 6 refers to.

Article 56 EPC

– D9 is the closest state of the art and describes all features of the patent-in-suit apart from the control, the regulation of the speed of the compressor and of the rotary valve assembly.

– The combination of D9 with D5, which describes the regulation of a device of the oxygen concentrator, namely the vacuum pump, renders the invention of the patent-in-suit obvious.

– A compressor may also be used for creating an under-pressure, e.g. for sucking nitrogen, as can be derived from D8.

– Alternatively D9 may be combined with D2, which document refers to the regulation of the compressor speed, to arrive at the present invention.

VIII. **Appellants'** main arguments with regard to the main request were as follows:

Article 123(2) EPC

– Pages 2/3 of the application as originally filed show that the home-size prior art device was improved and demonstrate the advantages of the claimed concentrator over these prior art devices.

– The direct control of the compressor speed and the rotary valve assembly can be derived from the figures, in particular Fig. 10 and the corresponding text in the description.

Article 83 EPC

– The Appellants could not find any proof for Respondent's allegations.

Article 56 EPC

– D9 is the closest state-of-the-art document.

– D5 teaches to control the speed of the vacuum pump, but not of the compressor; the compressor runs

always at the same speed. The skilled person would not combine D9 with D5, because both documents relate to different technical fields.

– D2 aims at maintaining a constant oxygen concentration, but not a prescribed flow rate. Thus, a combination with D9 would also not lead to the claimed invention.

IX. The Appellants requested that the decision under appeal be set aside and the patent be maintained on the basis of the main request filed during the oral proceedings or one of the auxiliary requests filed with the grounds of appeal.

The Respondent requested that the appeal be dismissed.

Reasons for the Decision

1. **Article 123(2) EPC - main request**

The Respondent objected to two terms as being not originally disclosed: "home size oxygen concentrator" and "directly adjusting".

1.1 Original disclosure of the feature "home size oxygen concentrator"

1.1.1 According to page 1, lines 9-11 of the description of the patent-in-suit as originally filed, the invention relates to an "apparatus for, and methods of, passing oxygen in compressed air (and argon) for introduction to a patient". Although the last paragraph, line 28 of the same page mentions, that the oxygen can be used for

many purposes, the application to patients is from the second part of line 28 onwards described as being one of the **primary** uses. In particular the first three paragraphs on page 2 describe the **continuous operation of the apparatus in the home environment** and the disadvantages of the prior art devices. In the paragraph bridging pages 2/3 it is concluded that the patent-in-suit overcomes these disadvantages of the prior art.

1.1.2 Thus, the Board does not have any doubt, that the feature "home size oxygen concentrator" was unambiguously derivable from the originally filed patent application.

1.2 Original disclosure of the feature "directly adjusting the speed of the compressor and the speed of the variable speed rotary valve assembly"

1.2.1 With regard to this feature the Appellants made reference to Figure 10 of the patent application as originally filed. The drawing shows a microprocessor (80), which is linked to a compressor (13), a rotary distributor valve assembly (21) and a flow control device (86). The text on page 12, lines 26-29 of the application as originally filed, which relates to Figure 10, defines, that the control device (80) is pre-set to any desired flow-rate. Thus, contrary to Respondent's argumentation, the means for **directly** adjusting the speed of the variable speed rotary assembly and the compressor to the prescribed flow rate are unambiguously derivable from Figure 10 and the corresponding parts of the description.

1.2.2 Although Figure 10 shows a "microprocessor", which is more specific than a "controller", it can be derived from the description on page 12, line 19 as originally filed, referring to Figure 10, that this figure represents a **schematic** drawing. Lines 31/32 of the same page state, that the microprocessor shown in the drawing is only a preferred embodiment of a "control device" used for the purpose described above.

1.3 Consequently, the features in question are considered to meet the requirement of Article 123(2) EPC.

2. **Article 83 EPC - main request**

The Respondent raised objections with regard to the features "home size oxygen concentrator" and "fluid pressure".

2.1 *Feature "Home size oxygen concentrator"*

The Respondent objected that the term "home size concentrator" be unclear and therefore violates Article 83, because of the vagueness of the expression "home size".

2.2 The Respondent has mentioned during the oral proceedings that term "home size" merely means, that the device can be used at the home of a patient. This statement contradicts with the alleged vagueness of the term, since it defines at least, that the oxygen concentrator must have such dimensions, that it can be used at home. Thus, the Board cannot see the alleged vagueness of the term resulting in a lack of sufficient disclosure.

2.3 In any case no proof has been filed by the Respondent for the allegation that the invention is not sufficiently clear and complete for it to be carried out by a person skilled in the art and lack of clarity is not a ground of opposition according to the EPC.

2.4 *Feature "Fluid pressure"*

According to the Respondent the term "fluid pressure" is used in Claim 6, "although there is no mention in the claim which fluid could be meant".

2.5 As described in the first part of Claim 6, air is introduced into the columns, nitrogen is adsorbed and oxygen passes through the columns. In a further phase of the concentration process the adsorbed nitrogen is desorbed again. Since the variable speed rotary drive and the compressor are described to regulate the said fluid pressure in the plurality of columns, the "fluid pressure" can only mean the air pressure in the columns, as is shown in lines 49-51 of paragraph [0010] of the patent-in-suit.

2.6 Also for this objection no proof has been submitted, that the invention is not sufficiently disclosed. Thus, the Board considers the requirement of Article 83 EPC to be met.

3. **Article 54 EPC - main request**

Novelty of the main request was not disputed by the Respondent. The Board does not see any reason to raise an objection in this respect.

4. **Article 56 EPC - main request**

According to the problem and solution approach, which is used by the Boards of Appeal of the European Patent Office in order to decide on the question of inventive step, it has to be determined which technical problem the object of a patent objectively solves vis-à-vis the closest prior art document. It also has to be determined whether or not the solution proposed to overcome this problem is obvious in the light of the available prior art disclosures.

4.1 Both parties agreed on D9 being the closest state of the art. The Board does not see any reason to deviate from this approach.

D9 describes a portable oxygen concentrator with features as defined in the patent-in-suit, but the speed of the rotary valve assembly and of the compressor are not regulated by a control.

4.2 Although the Appellants have argued that in addition to reduced power consumption also noise reduction, minimal size, optimal efficiency, reliability and life span are achieved by the patent-in-suit compared to prior art, no proof has been submitted for the latter effects, whereas the reduced power consumption is plausible due to reduced motor speed and has also been acknowledged by the Respondent. Thus, the objective problem solved vis-à-vis D9 is to be seen in a decreased power consumption.

4.3 As the solution to this problem, the device and the method according to Claims 1 and 6 have been proposed by the Appellants.

4.4 No objection has been raised by the Respondent that the invention has not been solved over the whole range claimed. The Board shares this view.

4.5 Respondent's main line of argumentation was, that the person skilled in the art would have combined the teaching of D9 with D5, respectively with D2, to arrive at the present invention.

4.5.1 As mentioned above, D9 describes a device as presently claimed, without the possibility to regulate the speed of the compressor and of the rotary valve assembly by means of a control.

D5 reports on a pressure-swing-adsorption plant particularly useful for sewage treatment. In order to reduce power consumption, the speed of a vacuum pump, which is used to regenerate the adsorbent beds, is controlled. Since a slow evacuation speed results in a prolonged time for regeneration of the bed, cycle time changes accordingly.

4.5.2 Respondent's conclusion was, that the vacuum pump could be equated with the compressor of the patent-in-suit and that the change of cycle time would correspond to the use of a variable speed rotary valve.

4.5.3 The Board cannot follow this reasoning: D5 describes the use of **both** devices, i.e. of a compressor and of a vacuum pump. On page 1, right-hand column, lines 70-85

D5 concludes, that the vacuum pump consumes more energy than the compressor. To achieve the aim of saving energy D5 proposes to run the **compressor** at a **constant** speed and to have a bypass line for recirculation if the pressure of oxygen is sufficiently high (D5, page 1, right-hand column, lines 111-125; Fig. 1).

4.5.4 In contrast thereto the **vacuum pump**, should be **controlled** in accordance with the demand of oxygen (D5, page 1, right-hand column, lines 126-129; Fig. 1).

4.5.5 Thus, there is a clear teaching to run the compressor at a constant speed and to vary only the speed of the vacuum pump. Even when reading the teaching of D9, relating to portable oxygen concentrators, in connection with D5, which relates to industrial sewage treatment, i.e. to a different technical field, the person skilled in the art would not find any teaching to control the speed of the **compressor *and*** of the **rotary valve assembly**. This would even not change when additionally deriving the knowledge from D8, that in the desorbing stage the column may be connected to the suction side of a compressor.

4.5.6 The combination of D9 with D5 (and D8) does not lead to the invention of the patent-in-suit.

4.5.7 As a second line of argumentation the Respondent combined D9 with D2. D2 aims at preventing surges in oxygen concentration by varying the speed of the compressor.

4.5.8 On the one hand the goal of D2 is to maintain a constant **oxygen concentration**, whereas the patent-in-suit aims at a **prescribed oxygen flow rate.** On the other hand, even when applying the teaching to control the speed of the compressor to D9, D2 is silent about the control of the speed of the rotary valve assembly.

4.5.9 Also the combination of these two documents does not lead to the invention of the patent-in-suit.

4.5.10 The requirement of Article 56 EPC is considered to be met.

5. **Further requests**

Since the main request already meets the requirements of the EPC, further discussion of the auxiliary requests is not necessary.

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 on the basis of the amended claim set 1 according to the main request filed during the oral proceedings and the description to be adapted.

The Registrar | The Chairman

G. Rauh | P.-P. Bracke