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Case Number: T 1954/09 - 3.3.07

Application Number: 02080409.2

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Title of invention:
Filtration monitoring and control system

Patent Proprietors:
Siemens Water Technologies Corp.

Opponents:
Zenon Technology Partnership

Headword:
-

Relevant legal provisions:
EPC Art. 76(1), 123(2)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Amendments - added subject-matter (yes) - all requests"

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-

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-

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Case Number: T 1954/09 - 3.3.07

D E C I S I O N
of the Technical Board of Appeal 3.3.07
of 14 October 2010

Appellants: (Patent Proprietors)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 16 July 2009 revoking European patent No. 1300186 pursuant to Article 102(1) EPC.

Composition of the Board:

Chairman: S. Perryman
Members: G. Santavicca
B. ter Laan

Summary of Facts and Submissions

I. The appeal by the patent proprietors lies from the decision of the Opposition Division revoking European patent N° 1 300 186, granted on European application N° 02 080 409.2, which is a divisional application of European application 96 905 596.1, originating from International application N° PCT/AU96/00144 (international publication number WO 96/28236) (referred to as parent application or D0), on which European patent EP-A-0 814 887 (referred to as parent patent) had been granted.

II. The parent application as filed (D0) comprised 28 claims, independent method claims 1, 5, 6, 19 and 25 reading as follows:

"1. A method of determining the fouling effect of a feedstream on a filter having known characteristics, said method comprising the steps of:

(i) passing the feedstream through a filter having known characteristics;

(ii) determining the change in resistance to flow of the feedstream across the filter, either continuously or over a number of time intervals; and

(iii) from this data, calculating a feed fouling index (FFI) representative of the fouling characteristics of the feedstream with respect to the filter."

"5. An on-line method of monitoring and controlling a filtering system, said method comprising the steps of:

(i) determining the resistance of filtering elements used in the filtering system by monitoring a number of operating parameters of the system;

(ii) calculating a feed fouling index representative of the fouling nature of the feedstream to the filtering system using the resistance value determined in (i); and

(iii) controlling the operation of the filtering system in dependence on the value of the feed fouling index calculated."

"6. An off-line method of determining the potential fouling effect of a feedstream, said method including the steps of:

(i) passing a sample of the feedstream at a predetermined pressure through a filter having known characteristics;

(ii) determining the change in resistance to flow of the feedstream across the filter, either continuously or over a number of time intervals; and

(iii) from this data, calculating a feed fouling index (FFI) representative of the fouling characteristics of the feedstream sample on the known filter."

"19. A method of monitoring the operation of a filtration system comprising the following steps:

(a) sampling system parameter values at selected locations within the filtration system at a predetermined sampling rate;

(b) generating a parameter profile characteristic from the sampled parameter values at predetermined intervals of time; and

(c) analysing the parameter profile characteristic to determine correct operation of the filtration system."

"25. A method of monitoring and controlling a filtering system, said method comprising the steps of:

(i) determining resistance values of filtering elements used in the filtering system at predetermined times during the backwash cycle of the system by monitoring a number of operating parameters of the system;

(ii) calculating a backwash efficiency value representative of the efficiency of the backwash cycle of the filtering system using the resistance values determined in (i); and

(iii) controlling the operation of the filtering system in dependence on the value of the backwash efficiency calculated.".

III. The divisional application as filed consisted of description and drawings that were identical to those of the parent application as filed (D0) and of Claims 1 to 10 that were identical to Claims 19 to 28 of D0.

IV. The patent granted on the divisional application (the patent in suit) comprised 6 claims, Claim 1 as granted reading as follows (additions to the claim as filed are indicated in bold, deletions in strikethrough):

"1. A method of monitoring the operation of a filtration system comprising the following steps:

(a) sampling system parameter values at selected locations within the filtration system at a predetermined sampling rate;

(b) generating a parameter profile characteristic from the sampled parameter values at predetermined intervals of time; ~~and~~

(c) ~~analysing the parameter profile characteristic to determine correct operation of the filtration system~~ **determining the change in resistance to flow of the feed stream across the filter, either continuously or over a number of time intervals, where**

$R = \Delta P \times A / \eta \times Q$

with R=Resistance, ΔP=change in pressure across the filter, A=filter area.*[sic]* η=viscosity of the feed stream and Q=flow across the filter; and

(d) **determining optimal operations of the filtration system using the information determined from steps a) to c).**"

V. An opposition seeking the revocation of the patent in suit as a whole was filed on the grounds that its subject-matter was not novel and did not involve an inventive step (Article 100(a) EPC) and extended beyond the content of both the divisional application as well as the parent application as filed (D0) (Article 100(c) EPC).

VI. In the decision under appeal, which was based on the claims as granted as the sole request, and which dealt only with the ground of opposition under Article 100(c) EPC, it was held that the patent as granted did not comply with Articles 76(1) and 123(2) EPC, because Claim 1 as granted - which was based on Claim 19 of D0

- contained amendments such as the deletion of feature (c) appearing in Claim 19 of D0, that extended the content of the patent in suit beyond that of the parent as well as the divisional applications as filed. Therefore, the patent was revoked.

VII. In their statement setting out the grounds of appeal, the appellants (patent proprietors) maintained the claims as granted as their Main Request and enclosed 4 sets of amended claims as Auxiliary Requests 1 to 4.

VIII. By letter of 31 March 2010, the respondents (opponents) filed observations on the statement setting out the grounds of appeal, maintaining all of the grounds of opposition raised in the opposition proceedings.

IX. In response to a communication of the Board in preparation for the oral proceedings, dated 14 July 2010:

- the appellants maintained the claims as granted as their Main Request, submitted three further sets of amended claims as Auxiliary Requests 1 to 3 and maintained the requests filed with their statement setting out the grounds of appeal as Auxiliary Requests 4 to 7 (letter dated 15 September 2010).
- the respondents maintained their grounds of opposition and reiterated their objections and arguments, also against all auxiliary requests (letter dated 14 September 2010).

X. The claims 1 of the auxiliary requests read (additions to the claim as filed are indicated in bold, deletions in strikethrough, additions to the claim as granted are bold underlined):

Auxiliary Request 1

"1. A method of monitoring the operation of a filtration system comprising the following steps:

(a) sampling system parameter values at selected locations within the filtration system at a predetermined sampling rate;

(b) generating a ~~parameter~~ **resistance** profile characteristic from the sampled parameter values at predetermined intervals of time; ~~and~~

(c) ~~analysing the parameter profile characteristic to determine correct operation of the filtration system~~ **determining the change in resistance to flow of the feed stream across the filter, either continuously or over a number of time intervals, where**

$R = \Delta P \times A / \eta \times Q$

with R=Resistance, ΔP=change in pressure across the filter, A=filter area, η=viscosity of the feed stream and Q=flow across the filter; and

(d) **determining optimal operations of the filtration system using the information determined from steps a) to c) by analysing the resistance profile characteristic**.".

Auxiliary Request 2

"1. A method of monitoring the operation of a filtration system comprising the following steps:

(a) sampling ~~system parameter~~ **pressure and flow** values at selected locations within the filtration system at a predetermined sampling rate;

(b) generating a ~~parameter~~ **resistance** profile characteristic from the sampled ~~parameter~~ **pressure and flow** values at predetermined intervals of time;"

(c) ... as in Auxiliary request 1...

(d) ... as in Auxiliary request 1...

Auxiliary Request 3

"1. A method of monitoring the operation of a filtration system comprising the following steps:

(a) sampling ~~system parameter~~ **pressure** values at selected locations within the filtration system at a predetermined sampling rate;

(b) generating a ~~parameter~~ **resistance** profile characteristic from the sampled parameter values at predetermined intervals of time; ~~and~~

(c) ~~analysing the parameter profile characteristic to determine correct operation of the filtration system~~ **determining ~~the change~~ an increase in resistance to flow of the feed stream across the filter, either continuously or over a number of time intervals, as a pressure across the filter increases, where**

$R = \Delta P x A / \eta x Q$

with R=Resistance, ΔP=change in pressure across the filter, A=filter area, η=viscosity of the feed stream and Q=flow across the filter; and

(d) **determining optimal operations of the filtration system using the information determined from steps a) to c) by analysing the resistance profile**

characteristic to determine an increase in a feed fouling index.".

Auxiliary request 4

"1. A method of monitoring the operation of a filtration system comprising the following steps:

(a) sampling system parameter values at selected locations within the filtration system at a predetermined sampling rate;

(b) generating a parameter profile characteristic from the sampled parameter values at predetermined intervals of time; ~~and~~

(c) ...as in Auxiliary Request 1...

(d) **determining optimal operations of the filtration system using the information determined from steps a) to c) by analysing the resistance profile characteristic to determine correct operation of the filtration system**."

Auxiliary Request 5

"1. A method of monitoring the operation of a filtration system comprising the following steps:

(a) sampling system parameter values at selected locations within the filtration system at a predetermined sampling rate;

(b) generating a parameter profile characteristic from the sampled parameter values at predetermined intervals of time; ~~and~~

(c) ~~analysing the parameter profile characteristic to determine correct operation of the filtration system~~ **determining the change in resistance to flow of the feed stream across the filter, either**

continuously or over a number of time intervals, where

$R = \Delta P x A / \eta x Q$

with R=Resistance, ΔP=change in pressure across the filter, A=filter area, η=viscosity of the feed stream and Q=flow across the filter, and calculating a feed fouling index representative of the fouling nature of the feedstream to the filtration system; and

(d) **determining optimal operations of the filtration system using the information determined from steps a) to c) by analysing the parameter profile characteristic to determine correct operation of the filtration system."**

Auxiliary Request 6

"1. A method of monitoring the operation of a filtration system comprising the following steps:

(e) sampling system parameter values at selected locations within the filtration system at a predetermined sampling rate;

(f) generating a parameter profile characteristic from the sampled parameter values at predetermined intervals of time; ~~and~~

(g) ~~analysing the parameter profile characteristic to determine correct operation of the filtration system~~ **determining the change in resistance to flow of the feed stream across the filter, either continuously or over a number of time intervals, where resistance values are determined by**

$R = \Delta P x A / \eta x Q$

with R=Resistance, ΔP=change in pressure across the filter, A=filter area, η=viscosity of the feed

stream and Q=flow across the filter, and calculating a feed fouling index representative of the fouling nature of the feedstream to the filtration system using the determined resistance values; and

(h) **determining optimal operations of the filtration system using the information determined from steps a) to c) in dependence on the values of the feed fouling index calculated."**

Auxiliary Request 7

"1. A method of monitoring the operation of a filtration system comprising the following steps:

(a) sampling system parameter values at selected locations within the filtration system at a predetermined sampling rate;

(b) generating a parameter profile characteristic from the sampled parameter values at predetermined intervals of time; ~~and~~

(c) ~~analysing the parameter profile characteristic to determine correct operation of the filtration system~~ **determining the change in resistance to flow of the feed stream across the filter, either continuously or over a number of time intervals, where**

$R = \Delta P x A / \eta x Q$

with R=Resistance, ΔP=change in pressure across the filter, A=filter area, η=viscosity of the feed stream and Q=flow across the filter, and calculating a feed fouling index representative of the fouling nature of the feedstream to the filtration system; and

(d) **determining optimal operations of the filtration system using the information determined from steps a) to c) <u>in dependence on the values of the feed fouling index calculated;</u>**

wherein step a) includes sampling pressure values with pressure sensing devices positioned on either side of the filter to relate resistance changes in terms of the change in pressure across the filter."

XI. Oral proceedings were held on 14 October 2010. After the closure of the debate and deliberation by the Board, the decision was announced.

XII. The appellants argued essentially as follows:

Main Request

(a) Since the divisional application as filed complied with Article 76(1) EPC, the only issue was whether or not the patent as granted complied with the requirements of Article 123(2) EPC. However, as granted Claim 1 was based on Claim 19 of D0, reference would be made to D0.

(b) Although D0 contained no literal disclosure for Claim 1 as granted, the criterion for determining whether subject-matter had been added was not whether a literal disclosure existed but whether a direct and unambiguous disclosure was present.

(c) Features a) and b) of granted Claim 1 and of claim 19 of D0 were identical. In the filtration

system as shown in Figure 6 of D0 only pressure and flow values were sampled. Step c) of claim 19 of D0 has been replaced by new steps c) and d), wherein however step c) should be seen as a more specific formulation of step b). Since "correct" and "optimal" operations had the same meaning, step d) of granted Claim 1 was a mere reformulation of step c) of claim 19 of D0. Hence, if any, only the features of step c) of granted Claim 1 could be seen as an addition.

(d) As regards the addition of new step c), the second and the seventh aspects of the invention as defined in Claims 5 and 19 of D0 both related to a method of monitoring and controlling the operation of a filtration system and solved the same problem, so that each could be used on its own or they could be used in combination. The apparent separation of the aspects was the mere result of an "American style" claim drafting. In fact, D0 mentioned no sampling of values within the context of its Claim 19 and the skilled person could not gather from the rest of D0 that parameter values other than the usual flow and pressure values were to be sampled. A parameter profile characteristic based on resistance values could hence be used also within the seventh aspect of the invention (Claim 19 of D0).

Moreover, from the first and second aspects of the invention, it was clear that the resistance of the filtering elements as well as a change in the resistance to flow of the feed stream across the filter could be used to calculate a Feed Fouling

Index, which was then used for monitoring and controlling a filtering system. Thus, the step of determining the change in resistance to flow of the feed stream across the filter (i.e. step c) of granted Claim 1) could be added in the method of monitoring the operation of a filtration system according to the seventh aspect of the invention of claim 19 of D0.

(e) Therefore, granted Claim 1 was directly and unambiguously disclosed in D0.

Auxiliary Request 1

Claim 1 of Auxiliary Request 1 was based on Figure 4 of D0, showing a parameter R_f, which was a resistance profile characteristic representing the change in resistance to flow of the feed stream across the filter due to fouling.

Auxiliary Request 2

Claim 1 of Auxiliary request 2 was based on the disclosure of D0 that sensors for pressure and flow characteristics of the feed stream could be provided at various points throughout the system.

Auxiliary Request 3

Claim 1 of Auxiliary Request 3 was based on the disclosure of D0 that the compressibility of a dirt layer was a measure of the increase in resistance.

Auxiliary Request 4

Step d) of Claim 1 according to Auxiliary Request 4 was identical to step c) of Claim 19 of D0.

Auxiliary Request 5

Claim 1 of Auxiliary Request 5 included the calculation of a feed fouling index representing the fouling nature of the feedstream, further defining the link between the second and the seventh aspect of the invention.

Auxiliary Request 6

According to claim 1 of Auxiliary Request 6, optimum operation of the filtration system was determined in dependence of the values of the calculated feed fouling index, as defined in steps ii) and iii) of claim 5 of D0. As the feed fouling index based on resistance values was one example of a parameter profile characteristic, - in which the resistance value might be based on pressure values as in the formula of present Claim 1 - a parameter profile based on resistance values could be used within the seventh aspect of the invention (Claim 19 of D0). The use of a feed fouling index in a method of monitoring and controlling a filtering system had been disclosed in the parent application as originally filed.

Auxiliary Request 7

Claim 1 of Auxiliary Request 7 indicated that pressure values sampled with pressure sensing devices on either

side of the filter related resistance changes to changes in pressure across the filter.

XIII. The respondents argued essentially as follows:

Main Request

(a) Claim 1 as granted was based on Claim 19 of D0 but did not contain original step c), which had been replaced by two new steps c) and d).

(b) New step c) was based on step ii) of Claim 1 and the description of D0. However, Claim 1 of D0 pertained to a different embodiment of D0 than did claim 19. Step ii) of Claim 1 could not be taken from its context and inserted into the different context of original Claim 19 of D0 because there was no specific basis for that in D0.

(c) Newly introduced step d) had not been described in D0, nor did this disclose the use of the information from all steps a) to c) for determining optimal operation of a filtration system, let alone how the information should be used in combination to determine optimal operation of filtration systems.

(d) In fact, it was clear from D0 that the method of its Claim 19 related to the correct operation of the filtration installation, i.e. to the observation of parameter profiles (actual *versus* desired) for detecting divergences, hence faults, such as valves working wrongly or faulty equipment. Instead, Claim 1 as granted related to optimal

operation of the filtration system, i.e. on maintaining and improving the way the installation was working, so that "optimal" also implied controlling the operation.

(e) As to the combination of steps c) and d), no aspect of D0 embodied it, nor was it disclosed in the context of Claim 19 of D0. The latter had not been contested by the appellants, who argued that Claims 1 and 5 of D0, respectively concerning the first and the second aspects of the invention, supported the amendments in Claim 1 as granted. The separate mentioning of the various aspects was not the mere result of an "American style" claim drafting, as D0 was based on four non-American priorities, i.e. on different inventions. Claim 19 of D0 concerned an aspect which did not relate to the feed fouling index, as did the first and the second aspects of the invention described in D0. Hence, the combination of steps from different method claims was not disclosed in D0.

(f) Therefore, granted Claim 1 added subject-matter to the contents of both the parent and the divisional applications as filed (Articles 76(1) and 123(2) EPC).

Auxiliary Request 1

(g) The arguments regarding the main request were also valid for Auxiliary request 1. The insertion of feature c) of Claim 19 of D0 in Claim 1 of Auxiliary Request 1, although it addressed the problem of the removal of an essential feature, did

not avoid the objection that the combination of steps c) and d) was not originally disclosed.

Auxiliary Requests 2 to 7

(h) In Auxiliary Requests 2 to 7 further features had been added to their respective Claims 1, some of which were based on independent Claims of D0. However, combining features that were never presented as being part of the same embodiment, as done in granted Claim 1, extended the content of the patent beyond that of both the parent and the divisional applications as filed.

(i) Hence, none of the requests was allowable, so that the patent should remain revoked.

XIV. The appellants (patent proprietors) requested that the decision under appeal be set aside and that the patent be maintained as granted or on the basis of one of the Auxiliary Requests 1 to 3 filed with letter dated 15 September 2010 or on the basis of one of the four Auxiliary Requests filed with the statement of grounds of appeal dated 19 November 2009.

XV. The respondents (opponents) requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

Article 76(1) EPC

2. *Divisional application as filed*

2.1 The patent application on the basis of which the patent in suit was granted is a divisional application of D0. Whereas D0 contains 28 claims, 28 description pages and 13 figures, the divisional application has 10 claims, 28 description pages and 13 figures. Its description and drawings are identical to those of D0 but the claimed subject-matter as filed was limited and identical to that of claims 19 to 28 of D0 only. However, the text of the other independent claims of D0, e.g. that of Claims 1, 5 and 6 of D0, referred to by the parties during the oral proceedings, is reproduced as such in the description of D0 (page 4, lines 8-15; page 5, lines 1-8; and page 6, lines 5-12, respectively). Hence, the text of Claims 1, 5 and 6 is also reproduced in the description of the divisional application as filed (Paragraphs [0014], [0017] and [0020], respectively, of the published version). Therefore, the divisional application as filed, on which the patent in suit was granted, complies with the requirements of Article 76(1) EPC, which fact was not contested by the parties.

2.2 However, while the original divisional application complies with Article 76(1) EPC, such is not necessarily the case with the granted patent. If the granted patent contains subject-matter that extends beyond the content of the application as filed, in other words does not comply with Article 123(2) EPC, the requirements of Article 76(1) EPC are not fulfilled either. Also, in the present case, if the granted

patent does not comply with Article 76(1) EPC, the requirements of Article 123(2) are not met either.

2.3 The usual procedure for judging the presence of added subject-matter is such that for Article 76(1) EPC the patent at issue will be compared with the parent application as filed (D0), for Article 123(2) EPC with the divisional application as filed, not with (D0). However, in the present case, reference may be made to D0, as the divisional application reproduces the content of D0 (point 2.1, *supra*).

Main Request

3. It is not in dispute that Claim 1 as granted is based on Claim 19 of the parent application as filed (D0).

3.1 Compared to Claim 19 of D0 (Point II, *supra*), Claim 1 as granted (Point IV, *supra*) contains, in its steps (c) and (d), the following modifications:

(a) The deletion of the feature "analysing the parameter profile characteristic to determine correct operation of the filtration system", i.e. the deletion of step (c) of Claim 19 of D0. No basis for that deletion has been indicated by the appellants, who have instead argued that step (d) of Claim 1 as granted is equivalent in scope to step (c) of Claim 19 of D0.

(b) The addition of a new step (c), which consists of the following two features:

(i) "determining the change in resistance to flow of the feed stream across the filter,

either continuously or over a number of time intervals", which, as such, is mentioned in D0, e.g. in step ii) of Claims 1 and 6, hence also in the divisional application as filed (Point 2.1, *supra*, third sentence).

(ii) "where R= ΔPxA/ηxQ, with R=Resistance, ΔP=change in pressure across the filter, A=filter area, η=viscosity of the feed stream and Q=flow across the filter". The formula was mentioned in D0, but with ΔP being the pressure across the membrane, A the membrane area, η the viscosity of the feed stream assumed to be water, and Q the flow through the membrane, (D0, paragraph bridging pages 12 and 13). It was used to calculate the feed fouling index (FFI).

(c) The addition of a new step (d), worded as follows: "determining optimal operations of the filtration system using the information determined from steps a) to c)", allegedly being equivalent in scope to step (c) of Claim 19 of D0.

3.2 For Article 76(1) EPC, the question to be answered is whether or not a method as defined in Claim 1 as granted had been directly and unambiguously disclosed in the parent application as filed (D0).

Disclosure of D0

4. D0 discloses different groups of subject-matter (called aspects), whereby the grouping is based on the parameter used for monitoring and/or controlling the filtration system, in particular:

4.1 A first group (the first to third aspects according to D0; page 4, line 8 to page 7, line 3), corresponding to the methods defined in Claims 1, 5, and 6 of D0, relies on the feed fouling index (FFI) as the parameter to be determined (Claims 1 and 6) and used (Claim 5) for monitoring and controlling the filtering system. The FFI is calculated from the change in the resistance to flow of the feedstream across the filter, either as a function of the volume filtered or in terms of the trans-membrane pressure (TMP) drop, using the formulae given on pages 12 and 13 of D0, which include the one given for the resistance as defined in present Claim 1 (see point 3.1(b)(ii) above).

4.2 A second group (the fifth aspect according to D0; page 8, line 19 to page 9, line 4), corresponding to the method defined in Claim 25 of D0, relies on the backwash efficiency of the filtering system (page 8, lines 6 and 7, of D0). The backwash efficiency is calculated from the values of the resistance of the filter elements at predetermined times during the backwash cycle according to the formula given on page 17, lines 10-13, of D0, also shown in Figure 5.

4.3 A third group (the seventh aspect according to D0), corresponding to the method defined in Claim 19 of D0, relies on the sampling of system parameter values at selected locations within the filtration system at a predetermined sampling rate. Those values are then used to generate a parameter profile characteristic; the analysis of that profile characteristic is used to determine whether or not the system operates correctly. The analysis may include comparing the generated

profile characteristic against a desired profile characteristic and identifying regions within the generated characteristic which diverge from the desired characteristic (D0, page 10, lines 3 to 5 and 14 to 16). The presence of a divergence indicates likely faults which may be corrected or circumvented so that the system operation can be returned to optimal (D0, page 10, lines 16-20). Thus, the third group neither relies on the feed fouling index (FFI) nor on the backwash efficiency. Instead, it relies on the analysis of the profile of several parameters (as shown in Figures 7 to 13 and the relevant detailed description thereof) for assessing any divergences caused by likely faults, such as during the backwash, which might hamper the functioning of the filtration system, as illustrated in Examples 1 to 3.

5. It follows from the foregoing analysis of D0 that the method of present Claim 1 as granted does not belong to any one of the groups or aspects mentioned in D0 but instead is a combination of features belonging to different embodiments of D0. This lack of literal disclosure is not in dispute. The dispute rather concerns the question of whether or not the combination of those features from different embodiments was allowable in view of the original disclosure. The appellants argued that such a combination was allowable because the different embodiments were only the consequence of an "American" drafting style of the claims and that their features could be combined and that step c) as granted was in fact a further specified step b). However, the amendments go beyond a mere combination of features or a further specification of the original steps.

5.1 Due to the deletion of step c) of Claim 19 of D0 (Point 3.1(a) *supra*) the analysis of the parameter profile characteristic is no longer required. That analysis may involve the comparison of a parameter profile generated in step b) and a desired profile, which comparison is, according to D0 (page 10, lines 3-5 and 14-22), necessary for identifying and analysing diverging regions in order to determine likely faults hampering the proper functioning of the installation. Since Claim 1 as granted no longer requires any analysis of the generated parameter profiles an essential aspect of the method of Claim 19 of D0 has been deleted.

5.2 The formula of present step c) of Claim 1 defining the resistance finds its basis on pages 12 and 13 of D0, where it is disclosed in the context for calculating the feed fouling index (FFI), which is the parameter to be determined and used according to the first group of embodiments (see point 4.1 above). Even if the now defined change in resistance were only in relation with two typically sampled system parameter values encompassed by step a) of Claim 1 as granted (or of Claim 19 of D0), i.e. pressure and flow, as alleged by the appellants, the determination of the change of resistance does not follow from the generation of a parameter profile characteristic as defined step b) of Claim 1 as granted, nor from a comparison with a desired profile (as step c) of Claim 19 has been deleted), but from a continuous or discontinuous measurement, by reading the cumulative volume of the feedstream passing through the filter over time or in terms of TMP (page 4, lines 19-22; page 6, lines 15-22).

Since D0 does not disclose the determination of the change in resistance from the given formula in the context of its Claim 19, new step c) is foreign to the context of original Claim 19 of D0 and its introduction in Claim 1 extends beyond the content of D0.

5.3 Furthermore, whilst step c) of Claim 19 of D0 concerned the determination of the correct operation of the filtration system from the analysis of the parameter profile characteristic generated in step b), step d) according to Claim 1 as granted concerns the determination of the optimal operations of the filtration system using the information determined from steps a) to c). Thus, step d) of Claim 1 as granted concerns a different assessment of a different state of the filtration system (correct *versus* optimal operation), whereby "correct" implies that all items of equipment such as valves and measuring instruments are properly functioning and "optimum" implies that the system is set/maintained at optimum filtration capacity. Hence, step d) of Claim 1 as granted is not equivalent in scope to step c) of Claim 19 of D0, as argued by the appellants.

5.4 For the reasons indicated above, claim 1 as granted does not comply with Article 76(1) EPC.

Article 123(2) EPC

6. Since the requirements of Article 76(1) EPC are not met and the application leading to the patent in suit, as originally filed, contains the same information as D0 (see point 2.1 above), the requirements of Article 123(2) EPC are not fulfilled either.

7. Consequently, the Main Request is not allowable.

Auxiliary Requests

8. All of the auxiliary requests have a Claim 1 that contains a step c) identical to that of the Main Request, so that the same objections apply (see points 5.1 and 5.2 above).

8.1 Moreover, in Auxiliary Requests 1 to 3 (Point X, *supra*), in step d), the further feature "by analysing the resistance profile characteristic" has been added. However, that feature is not mentioned as such in D0, let alone within the context of Claim 19 of D0, nor is it clear that the graph of Figure 4 of D0, indicated by the appellants as the basis for the amendment, would refer to that context or that of present claim 1.

8.2 In Auxiliary Requests 4 and 5 (Point X, supra) in step d), the further feature "by analysing the resistance profile characteristic to determine correct operation of the filtration system" has been added, thus introducing the features of step c) of Claim 19 of D0 as a part of present step d). However, that combination, even if it were directly and unambiguously disclosed in D0, confuses the determination of optimal operations with that of determining correct operations, so that the claim lacks clarity (Article 84 EPC).

8.3 In Auxiliary Requests 6 and 7 (Point X, supra), in step d), the further feature "in dependence on the values of the feed fouling index calculated" has been added. The basis given for that amendment is step iii)

of Claim 5 of D0, which however refers to the first group of embodiments, which relies on the feed fouling index (FFI). Therefore, that particular combination of features is not directly and unambiguously disclosed in D0 within the context of its Claim 19 (Article 76(1) and 123(2) EPC).

8.4 In view of the above, the Auxiliary Requests do not comply with the requirements of Articles 76(1) EPC, nor for the same reasons, with those of Article 123(2) EPC.

Conclusion

9. Since none of the requests fulfil the requirements of Article 76(1) and 123(2) EPC, the ground of opposition under 100(c) EPC prejudices the maintenance of the patent.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Fabiani S. Perryman