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**Datasheet for the decision  
of 17 December 2014**

**Case Number:** T 1925/10 - 3.3.05

**Application Number:** 99850044.1

**Publication Number:** 0948986

**IPC:** B01D46/52

**Language of the proceedings:** EN

**Title of invention:**

Folded Filter

**Patent Proprietor:**

Camfil AB

**Opponent:**

W. L. Gore & Associates GmbH

**Headword:**

**Relevant legal provisions:**

EPC Art. 100(a), 54, 56

RPBA Art. 13

**Keyword:**

Main request - inventive step - no

Late-filed first auxiliary request - clearly allowable - no

Second auxiliary request - novelty and inventive step - yes

**Decisions cited:**

T 0939/92, T 1634/09

**Catchword:**



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Case Number: T 1925/10 - 3.3.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.05**  
**of 17 December 2014**

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**Decision under appeal:**

**Decision of the Opposition Division of the  
European Patent Office posted on 16 July 2010  
revoking European patent No. 0948986 pursuant to  
Article 101(3) (b) EPC.**

**Composition of the Board:**

**Chairman** H. Engl  
**Members:** G. Glod  
P. Guntz

## Summary of Facts and Submissions

- I. The present appeal lies from the decision of the opposition division to revoke European patent EP-B1-0 948 986 for lack of inventive step.
- II. The following documents among others were cited in the decision:
- D1: EP-A-0 377 419
  - D2: DE-A-30 37 019
  - D3: JP-A-9 0190617 (English abstract)
  - D3B: JP-A-9 0190617 (machine translation)
  - D4: JP-A-8 196 847 (English abstract)
  - D4B: JP-A-8 196 847 (machine translation)
  - D5: JP-A-6 343 804 (English abstract)
  - D5B: JP-A-6 343 804 (machine translation)
  - D6: JP-A-5 329 314 (English abstract)
  - D6B: JP-A-5 329 314 (machine translation)
  - D7: JP-A-4 176 314 (English abstract)
  - D7B: JP-A-4 176 314 (machine translation)
  - D7C: JP-A-4 176 314 (human translation)
  - D8: DE-A-33 02 471
  - D9: US-A-5 415 676
  - D10: GB-A-2 310 812
  - D11: WO-A-97 27928
  - D12: JP-A-5 203 209 (English abstract)
  - D12B: JP-A-5 203 209 (machine translation)
  - D13: US-A-5 632 243
  - D14: GB-A-0 534 385
- III. The patent proprietor (hereinafter "the appellant") filed an appeal and submitted a first auxiliary request with the statement of grounds of appeal of 15 November 2010. The following document (cited in D9) was referred to:

D15: US-A-4 452 619

- IV. On 30 July 2014 the parties were summoned to oral proceedings.
- V. By letter of 26 November 2014 the opponent (hereinafter "the respondent") announced that it would not be represented at the oral proceedings.
- VI. Oral proceedings took place on 17 December 2014. The appellant submitted a new first auxiliary request and as a second auxiliary request maintained the auxiliary request filed with the statement of grounds of appeal.
- VII. The only independent claim of the **main request** (patent as granted) reads as follows:

*"1. Use of a filter for filtering air in a moist or wet environment, which filter comprises a folded filter material (1) that is held together by glue strings (2, 3) on front and rear sides of the filter material, wherein the filter during the use is mounted so that the folds are oriented vertically, the glue strings (2) on the front side of the filter material (1) being interrupted at the bottoms of the folds turned forwards establishing transport channels (4) for water are at the bottom of each forward turned fold, so that water (5) easily can flow down and out from the filter in the channels (4), the transport being enhanced by the gravity."*

Claim 1 of the **first auxiliary request** has been restricted by including the following passage at the end of claim 1 of the main request:

"..., wherein said use is for filtering air to gas turbines used for power supply at oil platforms."

Claim 1 of the **second auxiliary request** has been restricted by including the following passage at the end of claim 1 of the main request:

"..., wherein the glue strings (2) on the rear side of the filter material (1) are continuous."

VIII. The arguments raised by **the appellant** can be summarised as follows:

The orientation of the folds was not accidental, but served a particular purpose.

D5/D5B did not disclose the use of a filter for filtering air in a moist or wet environment. The filter material was not held together by glue strings and was not mounted vertically in use.

D7/D7B/D7C also did not disclose that the filter was mounted vertically during use.

None of D1 to D7 were directed to the same purpose or effect as the invention or related to the same or similar technical problem. They could thus not represent the closest prior art.

D9 could be taken as closest prior art, but the technical problem did not consist in finding a suitable alternative pleat spacing arrangement. Even if this were taken as the problem, there would be no reason to combine D9 with D1. Such a conclusion could only be based on an inadmissible *ex post facto* analysis.

The method for constructing dimples and the pleat solution described in D15 should be considered as incorporated in D9 and part of the teaching of D9. D9 taught that the pleat spacing should be narrower than in an ordinary air filter. The skilled person was not led to D1 to seek for an alternative pleat spacing.

As D9 taught away from ordinary air filters, the skilled person would not turn to D1. D1 related to an absolute filter and was not compatible with the set-up of D9. D1 did not teach any transport channels for leading water out of the filter. D1 was silent about the wet or moist environment and did not disclose that the filter was oriented vertically.

A key element of the invention as defined by the claims were the non-symmetric glue strings on the front side (interrupted glue strings) and the rear side (glue strings), respectively.

The objective problem was how to adapt the oil filter of D9 to improve its structural strength and at the same time secure efficient drainage of liquid.

D9 led the skilled person to a solution including a filter medium arranged with narrow pleat spacing maintained by integrally formed dimples. In addition, a low-surface-energy coating and/or low-surface-energy material for the filter medium was taught. D9 taught away from add-on solutions such as the glue strings shown in D1.

The first auxiliary request was submitted in order to overcome a novelty objection raised by the respondent. It therefore met the requirements of Rule 80 EPC.

IX. The arguments raised by **the respondent** can be summarised as follows:

The argumentation of decisions G 2/88 and G 6/88 did not apply here, since the patent in suit did not concern a new use of the filter, nor did the claimed use give rise to a new technical effect.

The filter according to D5B was certainly suitable for use in a moist environment. The vertical orientation of the folds was shown in Figure 1. D5B thus anticipated the novelty of claim 1 of the patent in suit.

D7/D7B/D7C also anticipated the novelty of claim 1 of the patent in suit unless the filter 10 in figure 2b was not considered to be vertical. But even if the functional features were considered to provide novelty, they could not be deemed inventive.

The expression "in a moist and wet environment" was unclear and did not lead to a well-defined restriction of the scope of claim 1. Every common use of a filter to filter outdoor air would lead to situations in which the environment was moist.

When choosing the closest prior art, the opposition division had interpreted the same purpose too narrowly.

D1 could be taken as closest prior art since it was not excluded in D1 that the filter could also be used to filter moist air. Vertically oriented folds could be envisaged by the skilled person. The problem to be solved was to reduce pressure drop when filtering air in moist or wet environments. The solution was obvious in view of the skilled man's knowledge or in view of D7 or in view of one of documents D8 to D14.



The same argumentation applied when starting from one of documents D2 to D6 as closest prior art.

The only difference having regard to D7 was that filter 10 shown in figure 2B was not oriented completely vertically. The problem to be solved in view of D7 was to improve the flow of the water. The solution was obvious in view of the skilled man's knowledge or in view of D8.

D9 concerned the same technical field and the same purpose as the patent in suit. It did not disclose glue strings. The problem to be solved was to find a filter with alternative spacing arrangements that did not impact on the flowing down of the water and that provided stability to the filter. D9 did not teach away from commonly used air filters provided that the pleats are spaced close enough together. The solution to the posed problem was obvious in view of D7 or D1 or D2 or D6.

D15 was not *prima facie* relevant and should not be admitted into the proceedings.

The auxiliary request submitted with the statement of grounds of appeal could not be considered inventive, since the feature introduced in claim 1 was already known from D7.

X. Requests:

The **appellant** requested that the decision under appeal be set aside and that the patent be maintained as granted or, alternatively, in amended form on the basis of the claims according to auxiliary requests 1 or 2

submitted during oral proceedings on 17 December 2014.

The **respondent** requested in writing that the appeal be dismissed. In addition, D15 should not be admitted into the proceedings.

## **Reasons for the Decision**

### 1. Claim interpretation

- 1.1 Claim 1 relates to the use of a filter for filtering air in a moist or wet environment. The filter is structurally defined in that it comprises a folded material held together by glue strings on the front and rear sides of the filter material, the folds being oriented vertically and the glue strings interrupted at the bottoms of the folds. The claimed use of the filter is thus restricted to "filtering air in a moist or wet environment", and the filter has to be vertically oriented. In this context, "vertical" is interpreted by the skilled person as being perpendicular to the plane of the earth's surface.

The result achieved by the structural features of the filter when used in vertical position is *"establishing transport channels for water ... at the bottom of each forward turned fold, so that water easily can flow down and out from the filter in the channels, the transport being enhanced by the gravity"*.

- 1.2 The claim feature relating to the "moist or wet environment" is understood by the person skilled in the art as an environment having a relative humidity higher than normal (the latter being up to approximately 70%). Therefore, the skilled person would understand that

claim 1 relates to the use of a filter for filtering air in an environment that has at least approximately 70% relative humidity.

### Main Request

2. Article 100(a) EPC - inventive step

2.1 Invention

The invention relates to the use of a filter for filtering air in a moist or wet environment.

2.2 Closest prior art

It is established jurisprudence that the closest prior art is normally a prior-art document disclosing the same purpose or aiming at the same objective as the claimed invention.

D9 is considered as closest prior art, since it concerns a filter medium having **vertically** oriented interconnected pleats treated with a low-surface-energy material to **facilitate agglomeration and drainage of liquid** droplets which accumulate on the inner and outer surfaces of the filter medium (D9: column 1, lines 9 to 13). The filter medium prevents airborne liquid from entering the downstream air (D9: column 2, lines 11 and 12). Pleats are correctly spaced by dimples (D9: column 5, lines 17 to 22).

Document D7/D7B/D7C, which the respondent considered as a possible starting point for the discussion of inventive step, does not concern the removal of water from the filter. The purpose of D7/D7B/D7C is to impregnate the filter 10 to allow the humidification of

the air passing through it. Although D7C discloses that the third filter can absorb water to prevent the water for humidification from being scattered (see page 8, first paragraph, last lines), the goal of the filter of D7 cannot be considered the same as that of the present invention, namely to make sure that the water is collected in a draining channel and flows out of the filters (see column 1, lines 38 to 51, of the patent in suit). Consequently, D7/D7B/D7C does not qualify as the closest prior-art document.

None of D1 to D6 discloses the filtering of air in a moist or wet environment. Consequently, these documents are also not suitable as closest prior art.

### 2.3 Problem

The problem underlying the patent in suit in the light of D9 can be seen as providing the use of a filter that has improved structural strength and is not influenced, or is limited only to a small extent, as to the pressure drop by moisture and water in the air that is to be filtered (see paragraph [0002] of the patent in suit).

### 2.4 Solution

As a solution to this problem, the patent in suit proposes the use of a filter according to claim 1, characterised in that the folded filter material is held together by glue strings on the front and rear sides of the filter material and the glue strings on the front side of the filter material are interrupted at the bottom of each fold to establish transport channels for water.

2.5 Success of the solution

It is not credible to the board that the above-defined problem is solved for all variants encompassed by claim 1. D9 already discloses that increased pressure can be withstood by spacing together the pleats more closely than on an air filter, thereby giving the filter medium additional structural integrity (see column 5, lines 31 to 34). The filter used according to claim 1 includes filters that only have small glue strings with considerable interruptions on the rear side. It is not plausible that such filters have improved structural strength compared to the filter disclosed in D9.

2.6 Redefinition of the problem

The problem should therefore be redefined as finding an alternative filter for use in filtering moist or wet air.

The board accepts that this reformulated problem is indeed successfully solved.

2.7 Obviousness

It needs to be determined whether the claimed solution is obvious in view of the prior art.

D9 discloses that the filter medium preferably has a high efficiency (D9: column 5, lines 14 to 16) and that the spacing between the pleats is maintained by dimples (D9: column 5, lines 18 to 22). A filter medium of that type is disclosed in D15 (D9: column 5, lines 22 to 26). Pleats on an **ordinary** air filter would probably collapse under the air pressure in the mist collection

system according to D9 (D9: column 5, lines 35 to 38).

D9 teaches that the filter to be used has to have a certain strength to withstand the pressure present in the system. While an **ordinary** air filter is not considered suitable, this does not in the board's view rule out using air filters having a strength higher than normal.

When looking for an alternative filter having such moderately increased strength, the skilled person would turn to any type of filter suitable for filtering air and having enough strength, irrespective of its construction.

A filter having increased strength is disclosed in D1. Said document discloses air filters and especially absolute filters that have a high efficiency and are made from a paper-like or other filter sheet material (D1: column 1, lines 1 to 5). As indicated above, high-efficiency filters are preferred in D9.

The filter of D1 is produced by applying glue in short broken lines to the upper and under sides of the filter sheet material. The filter sheet material is folded so that an even, wedge like appearance is obtained. At the apex of the wedge no glue is applied (D1: column 2, lines 1 to 11 and Figure). The glue holds the filter together, which increases the strength of the filter during use (D1: column 1, lines 42 to 45). The skilled person recognises that the air filter of D1 is not an ordinary air filter, but one with increased strength due to the presence of the glue. Therefore, the skilled person would use such a filter with a reasonable expectation of success to solve the problem posed.

It is evident that the filter has to be used vertically if it is used as an alternative to the filter in D9, since D9 teaches that the pleats are arranged vertically (D9: column 1, lines 9 and 10; column 5, lines 64 and 65).

Furthermore, it can easily be recognised from the figure of D1 that no glue is applied on the folding lines 2 on the upper side, so that a kind of channel is created. The water would inevitably flow along these channels when it is removed from air.

The use of the filter of D1 in the process of D9 thus leads, in an obvious manner, to the subject-matter of claim 1 of the main request.

As argued by the appellant, there may exist other alternatives that the skilled person could select. However, the fact that the skilled person has to choose among several possibilities to arrive at the claimed subject-matter is not an indication of inventive step if the **choice is made between alternatives that are equally suitable** (T 939/92, Reasons 2.5.3).

In conclusion, the subject-matter of claim 1 of the main request lacks an inventive step in view of D9 in combination with D1 (Article 56 EPC).

### First auxiliary request

3. Admissibility of the first auxiliary request
  - 3.1 Since the main request was filed after the grounds of appeal had been submitted and even after oral proceedings had been arranged, it constitutes an amendment to the party's case within the meaning of

Article 13 of the Rules of Procedure of the Boards of Appeal.

Thus, its admission is at the board's discretion, which to be exercised inter alia in view of the complexity of the new subject-matter, the state of the proceedings and the need for procedural economy. According to an approach frequently adopted by the boards (see T 1634/09, Reasons 3.2), a request filed at a very late stage in the proceedings (after oral proceedings have been arranged and the board has already given a preliminary opinion) may be admitted and considered at the board's discretion

- (i) if sound reasons exist for filing this request so far into the proceedings,
- (ii) if the request does not extend the scope of discussion,
- (iii) if the request is clearly or obviously allowable.

3.2 Said conditions (i) to (iii) are not met in the present case, for the following reasons:

ad (i): The respondent submitted its last reply including arguments on 21 March 2012. The respondent's complete case was known by then, and there have been no new developments in the case since. In the board's view, there is no justification for filing this request, including an amendment originating from the description, at the beginning of the oral proceedings before the board.

ad (ii): The request includes features from the description which aim at restricting the use of the filter. However, the auxiliary request submitted with the statement of grounds of appeal and large parts of



the argumentation provided by the appellant concentrated on the structures of the filter rather than on its purpose (use) (i.e. for filtering air to gas turbines). Therefore, this request leads the discussion in a different direction than the requests already on file. In addition, the respondent, which decided not to be represented at the oral proceedings, need not have expected such an amendment originating from the description. The board concludes that this request would extend the scope of discussion.

ad (iii): The amendment is based on the description, page 1, line 16. However, this passage relates to inlet filters to gas turbines. It is not apparent why the feature "inlet filter" has been omitted and whether that omission is directly and unambiguously derivable from the original application. In addition, it is not clear whether the inventive step objection raised for the main request could be overcome by the proposed amendment. As explained above, D9 relates to the same problem as the patent in suit and also concerns a water-oil environment (D9: column 1, lines 20 to 29). Therefore, the request is not clearly and obviously allowable.

Since none of conditions (i) to (iii) is met, the first auxiliary request is not admitted into the proceedings.

#### **Second auxiliary request**

Claim 1 is based on a combination of claims 1 and 4 as granted.

4. Article 54 EPC - novelty

4.1 D5/D5B discloses a folded filter having interrupted resin strings on both sides of the filter (D5B: paragraph [0014], drawing 2). D5/D5B does not disclose that the filter is used for filtering air in a moist or wet environment and that the glue strings on the rear side of the filter are continuous.

4.2 D7/D7B/D7C relates to the use of an air filter comprising a first filter 12 made of a low-density hydrophilic material, a second filter 14 made of a high-density, water-repellent material, an adhesive 16 in the form of strings and optionally a third filter 62 made of a low-density, water-repellent material in an air conditioner (D7B: figures 1A, 1B, 2B, 3A and 3B; D7C: page 4, paragraphs 1 to 4). It is not directly and unambiguously derivable from D7/D7B/D7C that the folds of the filter are oriented vertically when they are used for filtering and humidifying the air.

The claims of the second auxiliary request thus fulfill the requirements of Article 54 EPC.

5. Article 56 EPC - inventive step

5.1 The analysis provided under 2.1 to 2.3 above also applies here *mutatis mutandis*.

In particular, the problem underlying the patent in suit in the light of D9 consists in providing the use of a filter that has improved structural strength and is not influenced, or is limited only to a small extent, as to the pressure drop by moisture and water in the air that is to be filtered (see paragraph [0002] of the patent in suit).

## 5.2 Solution

As a solution to the above defined problem, the opposed patent proposes the use of a filter according to claim 1 of the second auxiliary request, characterised in that the folded filter material is held together by glue strings on the front and rear sides of the filter material, and the glue strings on the front side of the filter material are interrupted at the bottom of each fold to establish transport channels for water, wherein the glue strings (2) on the rear side of the filter material (1) are continuous.

## 5.3 Success of the solution

It is credible that the combination of interrupted glue strings on the front side with continuous glue strings on the rear side allows the problem posed under point 2.3 above to be solved and is superior to the filter shown in D9 in terms of filter strength. The problem posed is solved and a reformulation of the problem is not necessary.

## 5.4 Obviousness

It remains to be determined whether the claimed solution is obvious in view of the prior art.

D1 clearly teaches that the glue is not administered in one continuous line, but in short broken lines (D1: column 2, lines 3 and 4).

None of D2, D3/D3B, D5/D5B, D6/D6B disclose continuous glue strings (D2: figures 1 and 2 & page 7, last paragraph; D3B: drawings 1 to 9; D5B: paragraph [0014] & drawing 2; D6B: paragraph [0040] & drawing 1).

D4/D4B discloses continuous coating films of a thermoplastic resin (D4B: paragraphs [0020], [0023], drawings 3 and 4) that are applied to a filter. It also discloses that the filter contains thermoplastic separators 16 on both sides of the filter, whereby these separators are not continuous (D4B: paragraphs [0028] to [0032] and drawings 9 to 11). It is taught that these thermoplastic materials provide stability to the filter (paragraphs [0016] and [0032]). However, D4/D4B does not disclose that the strings on the front side should be interrupted, while being continuous on the rear side. D4/D4B rather relates to the problem of preventing an air leak (D4B: paragraph [0003]) and does not directly address the problem of filtering air in a moist or wet environment. The skilled person does not learn from D4/D4B that the strings should be discontinuous on the front side to allow water to flow down, while the strings on the rear side should be continuous to improve the strength of the filter.

As indicated above, D7/D7B/D7C discloses an air filter. It teaches that the folded surfaces on the downstream side that are not impregnated with water for humidification may be adhered over the entire fold width (D7C: page 7, last paragraph). However, D7 does not relate to the removal of water from air, but to air humidification. The skilled person trying to find a filter that removes water from air and has improved strength would turn to documents that relate to the same goal in order to find a suitable strong filter for the same purpose. Therefore the skilled person would not have turned to D7 when starting from D9 in view of the different objectives of the two documents. In addition, D7 does not teach the benefit in terms of strength of continuous glue strings on the rear side.

None of documents D8 to D14 disclose glue strings.

Therefore the proposed solution is not obvious from the prior art, which does not clearly teach or suggest such a combination of interrupted glue strings on the front side with continuous glue strings on the rear side for providing a filter that has improved structural strength.

Even when starting from D7, which the skilled person would not consider doing for the reasons set out under point 2.2, one would not arrive at the subject-matter claimed, since the goal of the filter of D7 is to absorb a sufficient amount of water for humidification (see D7C: page 4, lines 6 to 8, and page 6, lines 28 and 29). The water supplied at the upper portion may move down on the filter (D7C: page 7, second paragraph). This moving down appears to ensure that the water is absorbed over the whole filter. A vertical positioning would probably negatively influence this absorption, since the water would flow down faster due to gravity. The vertical orientation appears contrary to the teaching of D7.

In summary, the subject-matter of the claims of the second auxiliary request fulfills the requirements of Article 56 EPC.

6. The respondent's request not to admit D15 into the proceedings is not of relevance for the outcome of the present decision. Therefore no decision needs to be taken on that point.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent in amended form on the basis of the second auxiliary request, filed during oral proceedings on 17 December 2014, and a description and figures to be adapted.

The Registrar:

The Chairman:



C. Vodz

H. Engl

Decision electronically authenticated