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**Datasheet for the decision
of 24 January 2011**

Case Number: T 0248/06 - 3.3.05

Application Number: 98300349.2

Publication Number: 0858825

IPC: B01D 36/00

Language of the proceedings: EN

Title of invention:
Fuel filter with air vent

Patentee:
Delphi Technologies, Inc.

Opponent:
MAHLE Filtersysteme GmbH

Headword:

-

Relevant legal provisions:
EPC Art. 54, 52, 108, 123
EPC R. 101(1)

Relevant legal provisions (EPC 1973):

-

Keyword:

"Admissibility of the appeal (yes) - statement of grounds of appeal"
"Added subject-matter (understandable): no"
"Novelty (main request, auxiliary requests 1 to 3): yes"
"Main request, auxiliary requests 1 to 2: inventive step - no"
"Technical solution derivable from prior art documents"
"Inventive step (auxiliary request 3): yes - non obvious technical solution"

Decisions cited:

T 0220/83, J 0022/86, T 0213/85, T 0162/97

Catchword:

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Case Number: T 0248/06 - 3.3.05

D E C I S I O N
of the Technical Board of Appeal 3.3.05
of 24 January 2011

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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
23 December 2005 concerning maintenance of
European patent No. 0858825 in amended form.

Composition of the Board:

Chairman: G. Rath
Members: E. Waeckerlin
S. Hoffmann

Summary of Facts and Submissions

I. The present appeals were lodged against the interlocutory decision of the opposition division dated 23 December 2005, maintaining the European patent No. EP 0 858 825 B in amended form on the basis of a set of claims 1 to 4 filed as the third auxiliary request on 27 October 2005. Claim 1 as maintained by the opposition division reads as follows:

"1. A filter comprising a filter cartridge (22) located within a housing (10), the housing (10) having an inlet (18) and an outlet (20), the filter cartridge (22) and housing (10) defining an outer annular chamber (36) communicating with the inlet (18), the filter cartridge (22) defining an inner annular chamber (38) which communicates with the outer annular chamber (36) through a filter medium (34), the filter cartridge (22) and housing (10) defining a sedimentation chamber (44) which communicates with the inner annular chamber (38), the filter cartridge (22) carrying a sedimentation baffle (32) which is located within the sedimentation chamber (44), the sedimentation chamber (44) communicating with an outlet passage (28) extending through the filter cartridge (22), wherein the outlet passage (28) extends along the axis of the filter cartridge (22), the air collection chamber (46) comprising an annular chamber surrounding the outlet passage (28) and radially inward of the inner annular chamber (38), the outlet passage (28) extending downwards beyond the entrance to the air collection chamber (46), the outlet passage (28) communicating with the outlet (20), the sedimentation chamber (44) further communicating with an air collection chamber

(46), wherein the air collection chamber (46) communicates through at least one small opening (48) with the outlet (20), and wherein fuel passing through the filter has a linear flow path between the sedimentation chamber (44) and the outlet (20)."

II. During the opposition procedure, the parties relied *inter alia* on the following documents:

D1: DE 93 15 839.4 U1;

D2: US 3 502 218 A;

D3: EP 0 547 951 A;

D3b: EP 0 579 484 A1;

D4: EP 0 655 269 A2.

III. In the decision under appeal the opposition division acknowledged the novelty of the claimed subject-matter.

Regarding inventive step, the opposition division identified D2 as the closest prior art. The technical problem was seen in providing a radial fuel filter comprising means to additionally separate air from the filtered fuel. Neither D1 nor D3 disclosed a radial flow filter having outer and inner annular chambers, wherein the outlet passage extended downwards beyond the entrance to the air collection chamber. Therefore the combination of D2 with either D1 or, alternatively, D3 did not lead to the filter according to claim 1 of the third auxiliary request.

The opposition division concluded that the claimed subject-matter involved an inventive step.

- IV. Appeals were lodged by both the proprietor of the patent (hereinafter "appellant 1") and the opponent (hereinafter "appellant 2"), respectively.
- V. Together with its statement of grounds of appeal dated 25 April 2006, appellant 1 submitted five sets of claims as main request and first to fourth auxiliary request. In support of the main request and the four auxiliary requests, appellant 1 referred *inter alia* to decisions G 1/93, T 229/85, T 21/83, T 2/83, T 56/87 and T 220/83.

In a letter of reply dated 31 August 2006, appellant 1 submitted that no valid grounds of appeal according to Article 108 EPC had been provided by appellant 2 within the appeal period of four months. Appellant 2 had merely repeated certain statements made during the opposition procedure, without providing a single argument to justify the appeal or explain why the decision of the opposition division should be overturned. For this reason, the appeal lodged by appellant 2 should be regarded as inadmissible under Rule 101(1) EPC (corresponding to Rule 65(1) EPC 1973).

- VI. Appellant 2 acknowledged the novelty of the claimed subject-matter in its grounds of appeal dated 24 April 2006, but raised various objections on grounds of lack of inventive step against the main request and all auxiliary requests.

With letter dated 4 September 2006, appellant 2 reiterated its objections of lack of inventive step.

In a further letter of reply dated 13 December 2010, appellant 2 contested the novelty of the claimed subject-matter on the basis of the disclosure of D1.

VII. Oral proceedings were held on 24 January 2011. During the oral proceedings, appellant 1 maintained its opinion that the appeal lodged by appellant 2 should be regarded as inadmissible. Moreover, appellant 1 submitted five sets of amended claims representing the main request and auxiliary requests 1 to 4.

The wording of the independent claims of these requests is as follows:

Main request

Claim 1 of the main request has the following wording:

"1. A filter in which fuel flows through a filter medium in a substantially radial direction, the filter comprising a filter cartridge (22) located within a housing (10), the housing (10) having an inlet (18) and an outlet (20), the filter cartridge (22) and housing (10) defining an outer annular chamber (36) communicating with the inlet (18), the filter cartridge (22) defining an inner annular chamber (38) which communicates with the outer annular chamber (36) through the filter medium (34), the filter cartridge (22) and housing (10) defining a sedimentation chamber (44) which communicates with the inner annular chamber (38), the filter cartridge (22) carrying a

sedimentation baffle (32) which is located within the sedimentation chamber (44), the sedimentation chamber (44) communicating with an outlet passage (28) extending through the filter cartridge (22), the outlet passage (28) communicating with the outlet (20), the sedimentation chamber (44) further communicating with an air collection chamber (46), wherein the air collection chamber (46) communicates through at least one small opening (48) with the outlet (20)."

Independent claim 6 reads as follows:

"6. A filter cartridge for use in a filter including a housing (10), the filter cartridge defining an inner annular chamber (38) which communicates, in use, with an outer annular chamber (36) defined between the filter cartridge (22) and the housing (10), a filter medium (34) located between the inner and outer annular chambers (36, 38), a sedimentation baffle (32) located, in use, within a sedimentation chamber (44) defined between the housing (10) and the filter cartridge (22), the inner annular chamber (38) communicating with the sedimentation chamber (44), an outlet passage (28) and an air collection chamber (46), both communicating, in use, with the sedimentation chamber, and at least one small opening (48) whereby air can escape at a controlled rate from the air collection chamber (46)."

First auxiliary request

Claim 1 of the first auxiliary request corresponds to claim 1 of the main request, except that the following additional feature was added at the end of the claim:

"and wherein fuel passing through the filter has a linear flow path between the sedimentation chamber (44) and the outlet (20)."

Independent claim 6 of the first auxiliary request corresponds to claim 6 of the main request, with the exception of two additional features, namely:

(i) the filter medium is specified as a "filter medium (34) through which fuel flows in a substantially radial direction"; and

(ii) the feature "and wherein, in use, fuel passing through the filter has a linear flow path between the sedimentation chamber (44) and the outlet (20)." is added at the end of the claim.

Second auxiliary request

Claim 1 of the second auxiliary request corresponds to claim 1 of the first auxiliary request, except that the outlet passage (28) is further specified by the following features:

"wherein the outlet passage (28) extends along the axis of the filter cartridge (22), the air collection chamber (46) comprising an annular chamber surrounding the outlet passage (28) and radially inward of the inner annular chamber (38), the outlet passage (28) extending downwards beyond the entrance to the air collection chamber (46),"

Independent claim 5 of the second auxiliary request corresponds to claim 6 of the first auxiliary request, except that the outlet passage (29) is specified in the same manner as in claim 1 of the second auxiliary request (see above).

Third auxiliary request

Claim 1 of the third auxiliary request corresponds to claim 1 of the second auxiliary request, except that the outlet passage (28) is specified to extend downwards beyond the entrance to the air collection chamber (46) *"and downwards beyond the lowermost part of the baffle"*.

Independent claim 4 corresponds to claim 5 of the second auxiliary request, except that the extension of the outlet passage (28) is further specified as in claim 1 of the third auxiliary request (see above).

Fourth auxiliary request

There is no need to reproduce claim 1 of the fourth auxiliary request, since the third auxiliary request can be granted (see below).

- VIII. Appellant 1 dissented with the reasoning expressed by the opposition division in the decision under appeal, in particular the opposition division's finding that the subject-matter of claim 1 as granted lacks an inventive step, having regard to the disclosure of D2, D1 and D3, respectively. Appellant 1 held that the skilled person would not have combined the technical teachings of D2 and D1, or D2 and D3, because of inherent incompatibilities in the disclosed features, the language barrier, the long duration of time of 25 years between the publications, the large amount of intervening prior art in the relevant technical field, and the fact that D2 did not address the problem of

separating low-density contaminants from fuel. Even if the D2 and D1, or D2 and D3 were combined, this would not lead to the solution provided by the claimed filter.

Regarding the objections on ground of lack of novelty, appellant 1 pointed out that these objections were raised by appellant 2 for the first time in the letter dated 13 December 2010.

Appellant 1 contended that the filter according to Figure 3 of D1 disclosed neither a sedimentation chamber which communicates with the inner annular chamber, nor an air collection chamber. For these reasons alone, the claimed filter is novel.

Taking the disclosure of D2 as the starting point, the skilled person had no reason to expect that the teaching of D1 could lead to the solution of the technical problem. The considerations to the contrary made by appellant 2 were based on hindsight. Therefore the inventive step of the claimed filter was not at stake.

- IX. During the oral proceedings, appellant 2 contested again the novelty of the claimed filter, referring to the filter device represented in Figure 3 of D1. Concerning the specific feature of a sedimentation chamber defined by the filter cartridge and the housing, appellant 2 argued that the area between the lower support plate of the filter cartridge and the deflection element (Fig. 3, reference sign 51) could be regarded as a sedimentation chamber. Depending on pressures, water droplets would separate either on the outer or inner surface of the filter paper. In the

latter case, the water would accumulate at the bottom of the filter cartridge and remain there until the filter cartridge was replaced. Thus, there was no need to provide an opening for draining water from the sedimentation chamber.

Appellant 2 argued further that, irrespective of the considerations regarding novelty, the claimed filter did not involve an inventive step. Starting from the disclosure of D2 as the closest prior art, the technical problem could be seen in separating air from the clean side of the filter. When confronted with this problem, the skilled person would turn to D1, since D1 addresses specifically the de-aeration of fuel filters. Figure 3 of D1 shows a radial filter containing a dip tube arranged axially in the middle of the inner annular chamber. In its upper part, the dip tube has a small opening, which releases, in use, small air bubbles into the outlet passage. By using the same arrangement in the filter according to D2, the skilled person would arrive at the subject-matter of claim 1 of the patent in suit. In the view of appellant 2, such a modification was obvious to the person skilled in the art.

As far as the auxiliary requests were concerned, appellant 2 submitted that the feature of a "*linear flow path*" contained in claim 1 of the first auxiliary request has to be regarded as an inherent feature, since any pathway contains one or more sections having a linear flow. In this respect, appellant 2 relied, for example, on Figure 1 of D1.

According to appellant 2, Figure 1 of D1 discloses also the additional features of claim 1 of the second and the third auxiliary requests.

Regarding the additional features of claim 1 of the fourth auxiliary request, appellant 2 argued that they belong to the normal repertoire of the skilled person. Each feature of the embodiment according to claim 1 of the fourth auxiliary request has its well known technical effect. The various effects are unrelated, however, so that there exist no synergies or combination effects.

- X. Appellant 1 (patent proprietor) requested that the decision under appeal be set aside and the patent be maintained in amended form on the basis of the claims of the main request or, alternatively, of the auxiliary requests 1 to 4, all requests filed during the oral proceedings.

Appellant 2 (opponent) requested that the decision under appeal be set aside and that the European patent be revoked.

Reasons for the Decision

Admissibility of the appeal submitted by appellant 2 - Rule 101(1) EPC

1. In reply to the statement of grounds of appeal submitted by appellant 2, appellant 1 questioned the admissibility of the appeal for not being adequately substantiated (see letter dated 31 August 2006, page 2,

point 1.1 to page 4, point 1.3; page 7, point 3.2). Regarding claim 1 of the main request, appellant 1 argued that the comments made by appellant 2 were in the main inaccurate comparisons between the features of the alleged invention and D1, or repetitions of statements that had already been discussed during the opposition procedure. Appellant 2 did not substantiate why the person skilled in the art would have arrived at the claimed invention on the basis of the prior art. In particular, no explanation was given why the skilled person would have combined the disclosure of D3b with D1. Furthermore the feature analysis submitted by appellant 2 was insufficient, because certain features were not even mentioned, so that it was left to the reader to determine whether or not these features were novel. On the other hand completely new features were introduced. In addition, appellant 2 had amended, without adequate justification, Figure 1 of D1 in an attempt to demonstrate that the embodiment of Figure 1 of D1 could be adapted into that of the claimed invention. No credible argument was given, however, why the skilled person would have redesigned the embodiment of Figure 1 of D1 and arrived at the invention.

- 1.1 The only question with regard to admissibility to be decided here is, whether the statement of grounds of appeal filed by appellant 2 under cover of the letter dated 24 April 2006 complies with the requirement addressed in the third sentence of Article 108 EPC, according to which a written statement setting out the grounds of appeal has to be filed.

- 1.2 Whether or not the requirement of Article 108 is met, depends upon the substance of the document presented as

the statement of grounds of appeal. According to the established case law of the boards of appeal, the grounds of appeal have to specify the legal and factual reasons why the contested decision should be set aside and the appeal allowed. In particular, the arguments must be clearly and concisely presented to enable the board and the other party or parties to understand immediately, why the decision is alleged to be incorrect, and on what facts the appellant bases its arguments, without first having to make investigations on their own. In other words, it must be clear from the statement of grounds of appeal why in the appellant's opinion the contested decision is incorrect or, in the case of amended claims, why the amendments give rise to one or more objections under Article 100 EPC.

1.3 The examination of whether the requirement of Article 108 EPC, third sentence, is met, has to be made on the basis of the contents of the statement of grounds of appeal in the light of the reasons given in the contested decision (see, for example, J 22/86, OJ EPO, 1987, 280, reasons, 2; T 162/97, reasons, 1.1.2; T 213/85, OJ EPO 1987, 482, reasons 3), taking any amendments made to the claims into account.

1.4 In the present case, it is clear from the decision under appeal that the opposition division maintained the patent on the basis of the claims of the third auxiliary request, because it was found that, contrary to the claims of the main request and the first and second auxiliary requests, the requirements regarding the admissibility of the amendments (Article 123(2) EPC), novelty (Article 54 EPC) and inventive step (Article 56 EPC) were met. In particular, the

opposition division held that the combined disclosures of D2 and D1 or, alternatively, D2 and D3 did not lead to the invention, since one of the features contained in claim 1 of the third auxiliary request was still missing, namely the feature requiring "*the outlet passage (22) to extend below the air collection chamber entrance*" (see decision under appeal, points 5.4.2 and 5.4.3). For this reason the claimed filter was considered to involve an inventive step.

- 1.5 Appellant 2 referred in its statement of grounds of appeal to the set of claims 1 to 4 as maintained by the opposition division, arguing that these claims lacked an inventive step (see letter dated 24 April 2006, page 1, paragraph I). In support of the objection, appellant 2 submitted a feature analysis of the filter according to claim 1 as maintained by the opposition division, accompanied by two sheets of drawings taken from D1, but with a number of additional reference signs inserted by appellant 2 (see letter dated 24 April 2006, page 2, line 10 - page 5, line 23; annex A, annexes B/1 and B/2; annex C). On the basis of the claim analysis appellant 2 saw a complete congruence between the features of claim 1 as maintained (designated as features "a" to "p") and the filter disclosed in D1, except for some minor and irrelevant differences regarding features "c", "d", "e", "g" and "p", respectively (see letter dated 24 April 2006, page 3, lines 4 - 10; page 5, lines 22 - 23). As far as feature "p" was concerned, according to which "*fuel passing through the filter has a linear flow path between the sedimentation chamber (44) and the outlet (20)*", appellant 2 conceded that this feature was not disclosed in D1, since partial deflection of the flow

path took place in the filter of D1. In the opinion of appellant 2, the omission of a deflection element in the filter does not lead to a technical advantage, but on the contrary to a lower degree of air separation. For this reason, appellant 2 denied that the filter of claim 1 as maintained involved an inventive step (see letter dated 24 April 2006, page 5, line 26 to page 6, line 14).

1.6 The board takes notice of the various points of criticism voiced by appellant 1 against the statement of grounds of appeal of appellant 2, including the allegations of inaccurate comparisons, repetitions of previous statements, failure to explain why the skilled person would have combined certain documents, insufficient feature analysis and lack of arguments regarding the redesign of Figure 1 of D1 (see above). These objections are not an issue of admissibility, however, but of the substance of the case. In fact, even under the assumption that they were well-founded, the position expressed by appellant 2 would still be sufficiently clear to enable the board and appellant 1 to understand the reasons given by appellant 2 in support of its appeal.

1.7 Having regard to the foregoing, the board is satisfied that the statement of grounds of appeal dated 24 April 2006 sets out in a sufficiently clear manner why appellant 2 considered the decision under appeal to be incorrect. Nothing more is required by the relevant case law of the boards of appeal, in particular T 220/83 referred to by appellant 1 (see headnote). In the present case, appellant 2 stated adequately, for which the legal and factual reasons the decision under

appeal should be set aside. Therefore, the appeal is admissible under the terms of Article 108 EPC.

Allowability of the amendments - Article 123(2) EPC

2. No formal objections under Article 123(2) or (3) EPC were raised by appellant 2. The board is satisfied that all amendments effected to the claims of the main request and the first to third auxiliary requests are in conformity with Article 123(2) and (3) EPC. As far as the main request and the first and second auxiliary requests are concerned, there is no need to discuss the amendments in detail, since these requests cannot be granted anyway (see below). For this reason the following observations are restricted to the third auxiliary request.

2.1 Claim 1 of the third auxiliary request is based on the combination of claims 1, 2 and 3 of the application as originally filed.

- The feature of fuel flowing through a filter medium in a substantially radial direction is disclosed in the description of the application as originally filed (see page 1, first paragraph, lines 3 - 6; page 3, fourth paragraph, lines 1 - 5; claim 5). Furthermore it is implied by the presence of "*an outer annular chamber (36)*" and "*an inner annular chamber (38) which communicates with the outer annular chamber (36) through a filter medium (34)*" (see application as originally filed, claim 1; page 3, second paragraph; page 4, second paragraph, lines 6 - 12; Figure, reference signs 34, 36 and 38).

- The feature of a "*linear flow path*" of the fuel from the sedimentation chamber to the outlet can be derived

directly and unambiguously from the drawing, which shows that the sedimentation chamber (44), the axial dip tube (28) extending through the filter cartridge, and the outlet (20) are arranged in a line without any deflection elements, thus implying that "*fuel passing through the filter has a linear flow path between the sedimentation chamber (44) and the outlet (20)*" (see application as originally filed, Figure, reference signs 44, 28, 20).

2.2 The same considerations apply to claim 4 of the third auxiliary request, which contains substantially the same amendments as claim 1.

2.3 Dependent claims 2 and 3 of the third auxiliary request have a basis in claims 3 and 4, respectively, of the application as originally filed.

Novelty - Article 52(1) EPC and Article 54 EPC

3. Claim 1 of the main request and the first to third auxiliary requests

3.1 Figure 3 of document D1 discloses a filter, in which fuel flows through a filter medium in a substantially radial direction, the filter comprising a filter cartridge (see D1, Figure 3, reference sign 61; page 6, second paragraph, lines 1 - 6) located within a housing (Fig. 3, reference sign 60), the housing having an inlet (Fig. 3, reference sign E) and an outlet (Fig. 3, reference sign A), the filter cartridge and housing defining an outer annular chamber communicating with the inlet, the filter cartridge defining furthermore an inner annular chamber which communicates with the outer

annular chamber through the filter medium (Fig. 3, reference signs 19, 61, 22; page 6, second paragraph, lines 4 - 6). The filter cartridge and housing define a first area at the dirty side of the filter (see Fig. 3, area below the lower filter support plate) and a second area at the clean side of the filter which communicates with the inner annular chamber and the outlet passage extending through the filter cartridge (see Fig. 3, area between the lower filter support plate and the head of the deflection element, reference sign 51; annular chamber around the axial dip tube, reference sign 26; inner area of the deflection element, reference sign 51). The second area communicates further with a gas collection chamber (see D1, claim 1, line 9 "*Gassammelraum*"; not represented in Figure 3), which communicates in turn through at least one small opening with the outlet (see Fig. 3, reference signs 29, 17; page 6, second paragraph, line 11 "*Drosselöffnung 29*"). The outlet passage extends along the axis of the filter cartridge and communicates with the outlet (see Fig. 3, reference signs 26, 17, A).

- 3.2 The filter represented by Figure 3 of D1 does not comprise, however, a filter cartridge carrying a sedimentation baffle located within the area between the lower filter support plate and the head of the deflection element. In contrast, claim 1 of the main request and the first to third auxiliary requests requires the presence of a sedimentation baffle (see, for example, claim 1 of the main request, lines 7 - 9). Therefore, the filter according to claim 1 of the main request and of the first to third auxiliary requests is distinguished from the filter of Figure 3 of D1 by at least this feature.

- 3.3 There is a further distinguishing feature, namely the presence of a sedimentation chamber communicating with the inner annular chamber at the clean side of the filter. Figure 3 of D1 does not disclose such a sedimentation chamber. Neither in the drawing itself, nor in the corresponding text of the description of D1, the question of the sedimentation and collection of contaminants of relatively high density, for example water, is addressed at all.
- 3.4 At the oral proceedings, appellant 2 argued that, although not explicitly designated as such, the area between the lower filter support plate and the head of the deflection element (see D1, Figure 3, reference sign 51) represents a sedimentation chamber.
- 3.5 The board is not convinced by this argument. Nothing in D1 suggests that the area referred to by appellant 2 could have the function of a sedimentation chamber. On the contrary, it is unlikely that the area referred to by appellant 2 would be suitable for the purpose of sedimentation, because the area is relatively small, close to the inlet passage of the dip tube (22) and without an opening for draining water and other dense contaminants. On the basis of Figure 3 of D1, the skilled person would rather conclude that the much bigger zone at the dirty side of the filter between the bottom and the lower support plate acts as a sedimentation zone for contaminants having a relatively high density such as water.
4. Independent claim 6 of the main request and the first auxiliary request, claim 5 of the second auxiliary

- request and claim 4 of the third auxiliary request are all directed to a filter cartridge for use in the claimed filter. These filter cartridges are distinguished from the filter of Figure 3 of D1 by the same features as the corresponding filter, namely by a sedimentation baffle (32) located, in use, within a sedimentation chamber (44) defined between the housing and the filter cartridge (22) (see patent in suit, Figure, reference signs 32, 44, 22).
5. Claims 2 to 5 of the main request and the first auxiliary request, claims 2 to 4 of the second auxiliary request and claims 2 to 3 of the third auxiliary request are all dependent claims, deriving the novelty from the respective independent claim 1, to which they refer back.
 6. Apart from the embodiment of the filter represented by Figure 3 of D1, two further embodiments are disclosed in D1. These two embodiments concern so called "axial" filters, i e filters in which fuel flows through the filter medium in axial direction (see D1, Figure 1 and Figure 2; page 6, second paragraph, lines 1 - 6), as opposed to the "radial" filter according to Figure 3 of D1 and the present main and auxiliary requests.
 7. For the reasons set out above, the board concludes that the subject-matter of the claims of the main request and the first to third auxiliary requests is novel in respect of the disclosure of D1. No other document against novelty was cited by appellant 2.
 8. Document D2 discloses a fuel filter of the radial type, which resembles to the filter according to claim 1 of

the main request (see column 3, lines 3 - 15; drawings, sheet 1, Figure 2). In particular, the filter comprises an outer annular chamber communicating with the inlet (see Figure 2, inlet opening (18) and space between the housing (12) and the filter element (2)), an inner annular chamber communicating with the outer annular chamber through the filter medium (see Figure 2, space between the filter element (2) and the centre tube (5)). The filter element and the housing define a sedimentation chamber communicating with the inner annular chamber (see Figure 2, space below the filter element (2) and the bottom of the housing (12)). Moreover, the filter comprises a sedimentation baffle located within the sedimentation chamber (see Figure 2, annular flange (8)). The sedimentation chamber communicates with an outlet passage extending through the filter element, the outlet passage communicating with the outlet (see Figure 2, space within the centre tube (5) and outlet (20)).

- 8.1 The filter according to claim 1 of the main request is distinguished from the filter of D2 essentially by the presence of an air collection chamber communicating through at least one small opening with the outlet. Therefore, the claimed filter is novel having regard to the disclosure of D2.

The same applies by implication to the filters according to the first to third auxiliary requests.

9. Having examined the remaining documents D3, D3b and D4, respectively, the board is satisfied that the novelty is also given in respect of these documents.

10. For these reasons, the subject-matter of claim 1 of the main request and the first to third auxiliary requests meet the requirement of novelty laid down in Articles 52(1) and 54 EPC.

Inventive step - Article 56 EPC

11. The invention relates to a filter in which fuel flows in a substantially radial direction from an outer annular chamber through a filter medium to an inner annular chamber, and also to a filter cartridge suitable for use in the filter.
- 11.1 By arranging the fuel to flow through the filter medium in radially inward direction, clogging of the filter medium due to the effect of waxing is reduced (see patent in suit, page 3, left hand column, lines 42 - 47).
- 11.2 An essential object of the claimed fuel filter is to achieve a separation of contaminants of relatively high density, for example water, and contaminants of relatively low density, for example air, from the flow of fuel through the filter (see patent in suit, page 2, left hand column, lines 11 - 14; page 3, left hand column, lines 2 - 3 and 5 - 7).
12. Both parties to the proceedings agree that the filter described in D2 represents the closest prior art.

The board can accept this choice, since D2 relates to the same technical field, namely fuel filters of the radial type, and since the filter of D2 has the highest

number of features in common with the filter according to claim 1 of the main request.

13. In the fuel filter according to D2, fine droplets of water contained in the fuel agglomerate into larger drops when passing through the filter element. These larger drops are entrained in the flow of filtered fuel which, as it passes through the narrow passage between the lower end cap of the filter element (see Figure 2, reference sign 4) and the annular flange acting as a sedimentation baffle (see Figure 2, reference sign 8) horizontally towards a wider diameter portion of the filter, whereby the flow velocity of the filtered fuel and entrained water droplets is substantially reduced (see D2, column 1, line 71 to column 2, line 9). As a result, the water droplets, which are discharged at a point which is remote from the centre tube, and which have a reduced flow velocity, separate from the flow of filtered fuel and are collected in the sedimentation chamber (see D2, column 2, lines 14 - 20). Thus, water and other contaminants having a relatively high density are removed from the flow of filtered fuel.

14. Starting from D2 as the closest prior art, the technical problem can be seen in modifying the radial fuel filter of D2 in such a manner, that contaminants of both relatively high and low density, i e mainly water and air, are separated simultaneously and efficiently from the flow of fuel.

15. *Claim 1 of the main request*

- 15.1 As a solution to the technical problem, a filter according to claim 1 of the main request is proposed.

- The claimed filter is provided with an air collection chamber communicating through at least one small opening with the outlet.
- 15.2 Although the description of the patent in suit does not contain any specific examples relating to the operation of the fuel filter, there exist no reasonable doubts that the technical problem is solved by the claimed filter.
- 15.3 It remains to be decided whether the technical solution is obvious in view of the cited prior art.
- 15.4 When confronted with the problem of separating contaminants of relatively low density, the skilled person had at least two reasons to consider the disclosure of D1: On the one hand the embodiment of the "third filter" of D1 belongs to the same type of filters, namely radial fuel filters (see page 6, second paragraph, lines 1 - 13; Figure 3); on the other hand, D1 is specifically concerned with the separation of air from the flow of filtered fuel, in particular the avoidance of large air bubbles in the fuel injection system (see page 2, second paragraph, lines 1 - 11). Therefore, the skilled person would take D1 into account with a reasonable expectation of finding a solution. In view of the foregoing, the board is not convinced by the argument brought forward by appellant 1, according to which the consultation of D1 is based on hindsight.
- 15.5 As explained above, the filter of D1 is provided with a gas collection chamber ("*Gassammelraum*", see D1, claim 1, line 9), which communicates through at least

one small opening with the outlet (see D1, page 6, second paragraph, line 11 "*Drosselöffnung 29*"). In addition, there is a deflection element surrounding the low entrance of the axial dip tube (see D1, Figure 3, reference sign 51). These features lead to improved de-aeration of the flow of filtered fuel entering the dip tube (see D1, page 2, second paragraph, lines 1 - 5). Hence, there was a pointer in D1 to separate contaminants having a relatively low density, particularly air, from the flow of filtered fuel.

15.6 The board is of the opinion that it was obvious to the skilled person to make use of the technical solution provided by D1 and - since the separation of contaminants having a relatively high density, particularly water, formed part of the disclosure of D2 - to arrive at the filter according to claim 1 of the main request.

15.7 At the oral proceedings, appellant 1 argued that the absence of a deflection element in the claimed filter offers a significant technical advantage. This argument is irrelevant, however, because claim 1 of the main request is not restricted in any manner to filters having no deflection element. The mere fact that claim 1 does not mention a deflection element cannot be construed to mean that such an element is excluded from the scope of the claim.

15.8 Consequently, the subject-matter of claim 1 of the main request does not involve an inventive step as required by Articles 52(1) EPC and Article 56 EPC.

16. *Claim 1 of the first auxiliary request*

16.1 As a solution to the technical problem, claim 1 of the first auxiliary request proposes a filter which is further characterised by the feature that fuel passing through the filter has a linear flow path between the sedimentation chamber and the outlet. This feature implies *inter alia* that no deflection element surrounding the low entrance of the axial dip tube is present.

16.2 The board is satisfied that the filter according to claim 1 of the first auxiliary request solves the technical problem set out above (see point 13).

16.3 Regarding the obviousness of the claimed solution, the question to be answered is, whether this solution can be derived from the cited prior art.

16.4 The board notes that the filter disclosed in D2 is not equipped with such a deflection element either (see D2, Figure 2, central part of flange 8 and zone below it). Thus, the presence of an inventive step cannot be based solely on this feature, which is related to the requirement of a linear flow path between the sedimentation chamber and the outlet. Also, nothing in the patent in suit suggests that the absence of a deflection element gives rise to any unusual technical effect, let alone to an unexpected effect.

16.5 The board concludes, therefore, that the subject-matter of claim 1 of the first auxiliary request does not involve an inventive step as required by Articles 52(1) EPC and Article 56 EPC.

17. *Claim 1 of the second auxiliary request*

17.1 As a solution to the technical problem set out above (see point 13), claim 1 of the second auxiliary request proposes a filter, which is further characterised in that:

(i) the outlet passage extends along the axis of the filter cartridge;

(ii) the air collection chamber comprises an annular chamber surrounding the outlet passage and radially inward of the inner annular chamber; and

(iii) the outlet passage extends downwards beyond the entrance to the air collection chamber.

17.2 The board is satisfied that the technical problem set out above (see point 13) is solved by the claimed filter.

17.3 Regarding the question of obviousness, the board observes the following:

Two of the three features mentioned above, namely features (i) and (ii), are also present in the filter according to Figure 3 of D1 (see, in particular, Figure 3, dip tube 26; space between the dip tube 26 and the centre tube 22; space between the centre tube 22 and the inner surface of the filter element). In contrast, there exists a difference regarding the third feature (iii), since in the filter according to Figure 3 of D1, the outlet passage is on par with the entrance to the air collection chamber and does not extend beyond it.

17.4 The board is of the opinion that this difference results from a minor modification of the construction of the filter. The description of the patent in suit contains no evidence that this modification makes a significant contribution to the solution of the technical problem, or that it gives rise to an unusual effect, let alone an unexpected effect. In the absence such evidence, the board regards the implementation of feature (iii) as an obvious step.

17.5 For these reasons the subject-matter of claim 1 of the second auxiliary request does not involve an inventive step as required by Articles 52(1) EPC and Article 56 EPC.

18. *Independent claims 1 and 4 of the third auxiliary request*

18.1 As a solution to the technical problem set out above (see point 13), claim 1 of the third auxiliary request proposes a filter, which is further characterised by the provision of an outlet passage extending downwards beyond the entrance to the air collection chamber and downwards beyond the lowermost part of the baffle.

18.2 The board is satisfied that the technical problem set out above (see point 13) is solved by the claimed solution.

18.3 The question which remains to be answered is, whether the claimed solution is obvious in view of the cited prior art.

- 18.4 The particular construction as described above (see point 18.1) is illustrated in the drawing of the patent in suit (see Figure, entrance of the axially extending tube 28 located within the sedimentation chamber 44). By extending the axial tube beyond the level of the sedimentation baffle angled outwardly beneath the lower support plate, air carried with the flow of fuel tends to enter the air collection chamber rather than passing through the axially extending tube. By this, the risk of relatively large air bubbles continuing with the flow of fuel to the outlet is reduced (see patent in suit, column 3, lines 26 - 36).
- 18.5 Having regard to this important technical advantage, the board finds the argument presented by appellant 1 convincing, according to which the fuel filter of claim 1 of the third auxiliary request functions in a particularly efficient manner in respect of the separation of both, high density and low density contaminants, for example water and air.
- 18.6 At the oral proceedings, appellant 2 observed that Figure 2 of D2 discloses also an outlet passage extending downwards beyond the entrance to the air collection chamber and downwards beyond the horizontal sedimentation baffle. In the opinion of appellant 2 this casts doubt on the inventive step of the claimed filter.
- 18.7 The argument presented by appellant 2 is not convincing, however. D2 does not address the issue of the separation of air at all. Therefore, in spite of any constructional similarities, D2 provides no incentive

how the air or other contaminants having relatively low density can be separated from the flow of fuel.

- 18.8 The specific construction of the filter according to claim 1 of the third auxiliary request cannot be derived in an obvious manner from any of the cited prior art documents.

In view of the technical advantages set out above, and in the absence of evidence to the contrary, the board concludes that the filter according to claim 1 of the third auxiliary request involves an inventive step as required by Articles 52(1) EPC and Article 56 EPC.

19. Independent claim 4 of the third auxiliary request

The same considerations apply to the cartridge according to independent claim 4, since claim 4 has the same characterising features as claim 1.

20. Dependent claims 2 and 3 of the third auxiliary request

Claims 2 and 3 of the third auxiliary request depend on claim 1, to which they refer back. They derive their patentability from claim 1.

21. Since the third auxiliary request is allowable, there is no need to examine the fourth auxiliary request.

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 claims 1 to 4 of the third auxiliary request filed during the oral proceedings, a description and the figure to be adapted to the extent required.

The Registrar:

The Chairman:

C. Vodz

G. Rath