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D E C I S I O N
of 16 October 1998

Case Number: T 0973/97 - 3.2.4

Application Number: 91307698.0

Publication Number: 0475610

IPC: F02M 37/22

Language of the proceedings: EN

Title of invention:
Fuel tank filter

Patentees:
Filtertek, Inc.

Opponent:
Mannesmann VDO AG

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - yes"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0973/97 - 3.2.4

D E C I S I O N
of the Technical Board of Appeal 3.2.4
of 16 October 1998

Appellants: (Opponents)
Mannesmann VDO AG
Sodener Str. 9
65824 Schwalbach (DE)

Representative:
Zmyj, Erwin, Dipl.-Ing., Dipl.-Wirtsch.-Ing.
Rosenheimer Strasse 52/II
81669 München (DE)

Respondents: (Proprietors of the patent)
Filtertek, Inc.
P.O. Box 135
Price Road
Hebron
Illinois 60034 (US)

Representative:
Bayliss, Geoffrey Cyril
Boult Wade Tennant
27 Furnival Street
London EC4A 1PQ (GB)

Decision under appeal: Decision of the Opposition Division of the European Patent Office posted 17 July 1997 rejecting the opposition filed against European patent No. 0 475 610 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: C. A. J. Andries
Members: M. G. Hatherly
J. P. B. Seitz

Summary of Facts and Submissions

I. The decision of the opposition division to reject the opposition against the European patent No. 0 475 610 was dispatched on 17 July 1997.

On 11 September 1997 the appellants (opponents) filed an appeal against this decision and paid the appeal fee. The statement of grounds of appeal was received on 6 November 1997.

II. The following prior art documents were relied upon during the appeal proceedings:

D1: US-A-4 312 753

D2: EP-A-0 369 039

D3: "XX FISITA CONGRESS, The automotive future", SAE P-143, Society of Automotive Engineers, Inc., Warrendale, PA 15096, USA, May 1984, paper number 845045, "Carburants de Substitution: Orientations et Recherches Françaises"

D4: JP-A-62/41962, Patent Abstracts of Japan, vol. 11 Number 228 (M610) [2675], 24 July 1987

D5: US-A-4 077 887

D6: US-A-4 159 951

D7: DE-C-2 658 358

III. Oral proceedings were held on 16 October 1998.

IV. In the appeal proceedings the appellants argued that the claimed invention was obvious in view of the skilled person's basic technical knowledge and the cited prior art.

In the appeal proceedings the respondents (proprietors) countered the appellants' arguments.

During the oral proceedings the respondents filed amended claims and an amended page of the description for a main request, and amended claims for first, second and third auxiliary requests.

V. The independent claim 1 of the main request is as follows:

"A fuel tank filter (20) comprising:

(a) filtration material (24) forming an envelope (22);

(b) a separator (30) made of plastic inside said envelope (22) for holding the envelope (22) open and for biasing the envelope (22) towards the bottom of the fuel tank (14);

(c) a connector (34) for connecting the envelope (22) to the inlet (16) of a fuel pump (12), the connector (34) making a non-flexible connection between the separator (30) and the pump inlet (16);

characterised in that the filter further comprises a flat metal spring (50) inside said envelope and the spring (50) and the separator (30) are attached together to form a combined assembly which acts as a single element to bias the envelope (22) towards the bottom of the fuel tank (14)."

VI. The appellants request that the decision under appeal be set aside and the patent revoked.

The respondents request that the decision under appeal be set aside and the patent be maintained on the basis of the main request or one of the auxiliary requests:

Main request:

Claims: 1 to 12 according to the main request filed as Annex 1 during the oral proceedings on 16 October 1998

Description: columns 1 and 2 filed as Annex 5 during the oral proceedings on 16 October 1998

columns 3 and 4 as granted

Drawings: Figures 1 to 6 as granted

The **auxiliary requests** are based on claims filed as Annexes 2 to 4 during the oral proceedings on 16 October 1998.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments - main request*

2.1 Independent claim 1 of the main request adds to claim 1 as granted that the flat metal spring (50) is inside the envelope (22). This is clearly shown in the Figures of the original application and the patent as granted (in particular Figures 2, 3 and 5) and is in line with the particular description of the Figures.

Therefore the amendment to the granted claim 1 does not give rise to an objection under Article 123(2) EPC and, since the amendment restricts the scope of the granted claim, it does not give rise to an objection under Article 123(3) EPC either.

2.2 The dependent claims have been brought into line with claim 1 of the main request. The only amendment to the granted description is in line 26 of column 2 to bring this in line with claim 1 of the main request.

2.3 Accordingly the patent specification according to the main request does not contravene Article 123 EPC.

3. *Novelty - main request*

3.1 Figures 8 to 10 and column 5, lines 12 to 46 of D1 disclose a fuel tank filter 114 in accordance with the pre-characterising portion of claim 1 of the main request. The filtration material 118, 120 is sealed at edges 122, 124 and encloses ribs 128, 130 (corresponding to the separator in claim 1 of the main request) which tension the filter against the bottom 116 of the tank 100 because they are stiffly resilient. The separator can be made of nylon (see column 5, lines 39 and 40). The port fitting 144 is solid (see column 5, line 38) and so makes a non-flexible connection between the separator and the inlet of the pump 112.

The fuel tank filter disclosed by D2 also comprises an elastic support frame 1 made of thermoplastic, see column 2, lines 42 and 43.

However in neither D1 nor D2 is there a flat metal spring to assist the separator to bias the filter against the bottom of the tank.

3.2 Of the other documents D3 to D7 cited in the appeal proceedings, only D4 deals with a fuel tank filter but here, while there is a leaf spring 13 to bias the filter 11 downwardly, there is no filter envelope held open by a plastic separator.

3.3 Accordingly the subject-matter of claim 1 of the main request is novel (Article 54 EPC), a finding which is undisputed by the parties.

4. *Inventive step - main request*

4.1 The board finds the closest prior art or starting point for the invention to be the fuel filter known from D1. While the fuel filter of D2 also has an elastic supporting frame, this is provided not to bias the filter towards the fuel tank floor but in order to be able to introduce it into the tank in the first place.

4.2 The appellants argue that when the fuel tank filter of D1 is in use it will be noticed after a time that fuel delivery becomes faulty and the skilled person will realise that this is because the fuel tank filter does not remain in contact with the tank's bottom due to a lack of elasticity of the separator.

4.2.1 The skilled person is not a special filter expert but might be a team e.g. an engineer with knowledge of material separation in general with perhaps an automotive engineer or merely a mechanical engineer since the problem is not the separation process in the filter but the elasticity of the separator.

4.2.2 Since D1 points out in column 6, lines 39 to 42 that the wall and rib structures of the fuel filter should be made of the same material, e.g. polyvinylidene chloride, and since the separator must be such as to not damage the filter envelope material which surrounds

it, the skilled person would not merely change the separator material to metal to overcome the lack of elasticity. Since changing the particular plastic used would entail investigation to find a suitable plastic, the skilled person would naturally use a composite material. He finds in D6 such a composite, namely metal rods to stiffen a plastic assembly (see column 4, lines 5 to 10), and it is obvious for him to generalise this teaching to realise that metal could be used not to stiffen a plastic component but to improve its elasticity. The skilled person is moreover aware of other composites such as concrete reinforced with metal rods, and the metal-rubber filter sector of D5. When a property is missing from a component it is obvious to add a second material to provide this property. Lines 17 to 30 of page 2.157 of D3 point out that while some plastics give problems in fuel this is not the case for metal parts. Further, a leaf spring, which can be assumed to be of metal, is disclosed by D4 to bias the filter 11 downwardly.

4.2.3 Accordingly the skilled person would add a metal piece to the plastic separator of D1 to solve the elasticity problem.

4.3 The board agrees that once the skilled person has realised that the deterioration of the fuel supply via the fuel filter of D1 is due to the diminishing elasticity of its plastic separator, he will try to find a solution.

4.3.1 The statement in lines 39 to 42 of column 6 of D1 that it is generally desirable to make the filter wall and the separator of the same plastic, e.g. polyvinylidene chloride, would not lead the skilled person to add a flat metal spring to the plastic separator but rather would lead him to seek another plastic material. The passage of D3 cited in the preceding section 4.2.2

would also lead him in this direction because it explains that not all plastics materials suffer from permeability and swelling, i.e. that **some** plastics **could** be used. While it states that metal is not in general subject to corrosion in fuels, D3 presents metal neither as a replacement for, nor as an addition to, plastics. By choosing another plastic the skilled person would preserve the economic advantage of using a single material for the separator instead of making an assembly.

4.3.2 The documents which deal with using metal to stiffen a structure add nothing of value in the present case to the skilled person's basic knowledge of composite materials. To argue that the skilled person could generalise the teaching of stiffening to a teaching of adding a missing property and then refine this teaching to a teaching of adding elasticity is the result of an ex post facto analysis. The separator of the present fuel tank filter must be flexible, if the separator were too stiff the filter could not remain in contact with the fuel tank floor. Adding stiffness to a separator which has lost its elasticity does not solve the problem, it is the elasticity which needs to be restored. There is thus a big difference between adding metal in the form of a rigid rod and adding metal in the form of a flat spring.

4.3.3 Moreover while D5 and D6 concern filters, these filters are respectively a vacuum disc slurry filter and a rotary disc vacuum filter. Accordingly they are so far removed from a fuel tank filter that they would not be consulted by the skilled person in the present case. The same can be said of D7 which concerns a suspension for an exhaust pipe.

4.3.4 The board accepts that it would be obvious for the skilled person that the leaf spring 13 of D4 is of metal but the D4 filter is of a basically different type to that of D1, e.g. there is no filter envelope held open by a separator, so D4 could not hint to the skilled person to add this spring to the **separator** but at best only to use a spring externally to the filter envelope.

4.4 The skilled person in his search for a solution to the faulty fuel delivery problem could proceed in a number of ways. These include modifying the tank shape or material or stiffening it so that its floor does not move as much relative to the pump inlet, or, if he realises that the elasticity of the separator has been degraded, he could change its material. The board, for the above reasons, see no logical chain to take the skilled person towards providing a composite of a plastic and a particular form of metal, namely a flat metal spring. The latter might be expected to provide a danger to the filter envelope's integrity but the patent specification explains, for example, how it can be located in the plastic of the separator to avoid this danger.

4.5 The subject-matter of claim 1 of the main request is thus patentable as required by Article 52 EPC.

5. The patent may therefore be maintained amended, based on this independent claim 1, claims 2 to 12 which are dependent thereon, the adapted description and the drawings.

6. Consideration of the respondents' auxiliary requests is therefore unnecessary.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent in the following version:

Claims: 1 to 12 according to the main request filed as Annex 1 during the oral proceedings on 16 October 1998

Description: columns 1 and 2 filed as Annex 5 during the oral proceedings on 16 October 1998

columns 3 and 4 as granted

Drawings: Figures 1 to 6 as granted

The Registrar: The Chairman:

S. Fabiani C. Andries