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D E C I S I O N
of 20. December 2000

Case Number: T 0485/97 - 3.3.5

Application Number: 89850003.8

Publication Number: 0377420

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Language of the proceedings: EN

Title of invention:
Air filter

Patentee:
CAMFIL AB

Opponent:
Firma Carl Freudenberg Patente und Warenzeichen
Gebrüder Trox Gesellschaft mit beschränkter Haftung
AAF International

Headword:
Air filter/CAMFIL

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - no, obvious modification"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0485/97 - 3.3.5

D E C I S I O N
of the Technical Board of Appeal 3.3.5
of 20 December 2000

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 13 February 1997 revoking European patent No. 0 377 420 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: R. K. Spangenberg
Members: G. J. Wassenaar
M. B. Günzel

Summary of Facts and Submissions

I. The appeal is from the decision of the Opposition Division to revoke European patent No. 0 377 420, which was granted with claims 1 to 5 in response to European patent application No. 89 850 003.8. Granted claim 1 reads as follows:

"Air filter for the provision of a very clean surrounding at for instance mounting stations for electronic circuits etc. and including a zigzag folded filter sheet forming wedges open alternately towards the inlet and towards the exit side of the filter as filtering material characterized by a fine mesh material or other easily air penetratable sheet material with small passages for the air placed on the exit side of the filter directly after the zigzag folded filter sheet so that all air part flows leaving the zigzag folded filter sheet are broken up into multiple multidirectional small flows, which then compensate each other in a lateral direction whereas the general flow direction is retained and a very even flow is obtained."

It was held that the subject-matter of claim 1 lacked an inventive step within the meaning of Article 56 EPC. Reference was made, inter alia, to the following prior art documents:

D5: CH-A-576 109
D6: US-A-4 135 900
D7: DE-A-1 202 762.

II. In the statement of the grounds of appeal, the appellant (proprietor) maintained that the product of

claim 1 was not obvious in view of the documents cited in the decision under appeal.

The respondents (opponents 01, 02 and 03) contested the appellant's arguments. Respondent O2 relied in particular upon the prior art document GB-A-1 272 564.

III. With a communication dated 17 July 2000 the Board expressed its preliminary opinion that the air filter according to granted claim 1 seemed to lack an inventive step over GB-A-1 272 564. It was argued that the air filter of the patent in suit seemed to differ from the air filter according to GB-A-1 272 564 essentially only in that an air diffuser, supported by a metal mesh, was replaced by an unsupported air diffuser. This substitution was considered to be merely an equivalent design not departing from the general teaching of GB-A-1 272 564.

IV. In reply, the appellant maintained that the subject-matter of claim 1 was not obvious in view of GB-A-1 272 564. Reference was made to the Guidelines for Examination in the EPO, C IV, 9.8 and 9.9. The appellant's arguments can be summarized as follows:

The metal mesh and its space in GB-A-1 272 564 influenced the air flow so that the pressure over the outlet area might become more uniform. Replacing a supporting metal mesh and diffuser by an easily air penetratable sheet material according to present claim 1 was not an equivalent substitution. Moreover GB-A-1 272 564 was not concerned with the problem of getting an even flow at sensitive work stations; its object was a strong filter construction. The permeable sheet material of the invention could be an ordinary

filter material and did not have to have any particular strength since it might be glued to the filter matrix. The sheet and the filter matrix could strengthen each other. Prior to the invention, an air space between the folded filter sheet and the permeable sheet material was thought to be necessary to obtain an even flow. The invention overcame this technical prejudice allowing a more simple construction without any intermediate space for pressure equalisation.

V. The appellant requested that the decision under appeal be set aside and that the patent be maintained as granted.

The respondents requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. The Opposition Division revoked the patent on the ground of lack of inventive step. In view of the outcome of these appeal proceedings the Board considers it unnecessary to give a reasoned opinion on any other issue.

3. In the communication dated 17 July 2000, the Board indicated that GB-A-1 272 564 seemed to represent the closest prior art. This preliminary opinion remained uncontested. The Board, therefore, takes GB-A-1 272 564 as a suitable starting point for an inventive step analysis. This prior art document discloses a high efficiency air filter including a zigzag folded filter sheet and an additional layer of a demembraned

synthetic plastics foam through which air can pass (hereinafter generally referred to as "diffuser sheet") situated on the exit side of the zigzag folded filter sheet. Between these sheets a reinforcing expanded metal mesh is situated and bonded to these sheets (page 1, lines 10-14, lines 33-42, lines 81-85, page 2, lines 2-10, lines 50-61 and Fig. 1). As indicated in the said communication of the Board and not contested by the appellant, said diffuser sheet is an easily air penetratable sheet material which breaks up all air part flows leaving the zigzag folded filter into multidirectional small flows within the meaning of present claim 1. Therefore, the air filter according to present claim 1 differs from the air filter disclosed in GB-A-1 272 564 only by the feature that the easily air penetratable sheet material is placed **directly** after the zigzag folded filter sheet. In the appellant's favour the Board accepts that said feature implies that no space and no construction element is present between the two filter sheets.

4. According to the appellant's submissions and in agreement with statements in the patent in suit (column 1, line 52 to column 2, line 1) the patent in suit shall provide an air filter of simpler construction. The air filter as defined by claim 1, however, comprises only the filter material and the diffuser. In order to obtain a functional air filter, the zigzag folded filter sheet and the diffuser sheet must be placed into a frame. The patent in suit is silent about the frame to be used. Because of its internal support by the reinforcing mesh, the frame construction of the filter according to GB-A-1 272 564 can be simple, without a support at the exit side of the filter (Fig. 1). For zigzag folded filters without

internal support, however, frame constructions are necessary having at least at their exit side perforated supporting members to keep the folded filter into position; see eg D5 (Fig. 1), D6 (Fig. 6-9) and D7 (Fig. 3). Thus, functional prior art zigzag folded filters have either an internal supporting member as shown in GB-A-1 272 564 or an external supporting member as shown in D5 to D7. Assuming that the air permeable material of the diffuser is an ordinary filter material, as submitted in the appellant's reply to the communication of the Board, its stability has not been shown by the appellant to be sufficient to be used in combination with a zigzag folded filter without external support at the exit side of the filter, nor is claim 1 restricted to particular diffuser materials being rigid enough to allow the omission of an external support. In the Board's view the replacement of an internal support by an external support cannot be regarded as a simplification. Under these circumstances the Board considers that starting from GB-A-1 272 564 the problem underlying the invention was the provision of a further air filter for providing a very clean surrounding.

5. It remains to be decided whether it was obvious to a person skilled in the art to solve the said problem by a construction according to claim 1.

The function of the metal mesh in GB-A-1 272 564 is to stabilize the zigzag folded filter and the diffuser sheet. The use of a reinforcing metal mesh is, however, not the essential teaching of GB-A-1 272 564. Essential in the teaching of GB-A-1 272 564 is the use of a layer of glass fibre paper having a water-repellant coating in the folded filter (claim 1). An air filter

comprising a metal mesh between the folded filter and the diffuser sheet is only one embodiment of the teaching of GB-A-1 272 564, which makes it possible to use the filter in a frame without additional support on the exit side of the filter as shown in Fig. 1. As already indicated above, many prior art filter frames for zigzag folded filters have a supporting member in the form of perforated plates or sheets at the exit side of the filter in order to keep the filter material into position. It is evident that for use in a frame with a supporting perforated sheet or plate, the filter itself does not need to have additional support. Thus, for use in a frame comprising a supporting perforated plate it was obvious to a skilled person to modify the filter disclosed in GB-A-1 272 564 by deleting the supporting mesh between the zigzag folded filter and the diffuser sheet and thus arrive at the filter composition as defined by claim 1.

6. The appellant's argument that the metal mesh in GB-A-1 272 564 makes the air flow more uniform, so that it is not obvious to delete it, cannot be accepted. As submitted by the appellant, GB-A-1 272 564 is silent about the problem of getting an even flow and does not discuss the influence of the reinforcing mesh on the air flow. Considering the thinness and structure, in particular the large apertures of the mesh (14) shown in Fig. 1 and 2, there is no apparent reason why the skilled person should have expected that its presence has a substantial impact on the air flow leaving the diffuser sheet (18). Thus the skilled person would not consider any substantial deterioration of the air flow by replacing the internal metal mesh in the filter composition by an external metal mesh in the frame of the air filter. In the Board's opinion this exchange of

components must, therefore, be regarded as an obvious modification of the filter disclosed in GB-A-1 272 564, which does not involve an inventive step.

7. The appellant's contention that prior to the invention an air space between the zigzag folded sheet and the diffuser was thought to be necessary to obtain an even flow, has not been substantiated. It is true that in D5 the diffusers are situated far away from the folded filter but there is no indication that this distance is necessary for obtaining an even flow. Rather the use of a central air filtering system with two air exits for turbulent free air near the working station, as shown in Fig. 1-3, required the separation between diffuser and filter. The "technical prejudice" alleged by the appellant, therefore, did not exist so that the Guidelines for Examination in the EPO, C IV, 9.8 and 9.9, referred to by the appellant, are not contravened by the Board's assessment of inventive step.

8. For these reasons, the subject-matter of claim 1 as granted does not involve an inventive step within the meaning of Article 56 EPC, so that the appeal must fail.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Hue R. Spangenberg