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D E C I S I O N
of 17 March 1994

Case Number: T 0519/93 - 3.4.2

Application Number: 89850003.8

Publication Number: 0377420

IPC: B01D 46/52

Language of the proceedings: EN

Title of invention:
Air filter

Applicant:
Camfil AB

Opponent:
-

Headword:
-

Relevant legal norms:
EPC Art. 54, 56

Keyword:
"Novelty (after amendments, yes)"
"Inventive step (after amendments, yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0519/93 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 17 March 1994

Appellant: Camfil AB
Industrigatan
S - 150 13 Trosa (SE)

Representative: Berglund, Erik Wilhelm
Berglunds Patentbyra AB
Aspebraten
S - 590 54 Sturefors (SE)

Decision under appeal: **Decision of the Examining Division of the European Patent Office dated 4 February 1993 refusing European patent application No. 89 850 003.8 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: E. Turrini
Members: M. Chomentowski
B.J. Schachenmann

Summary of Facts and Submissions

I. European patent application No. 89 850 003.8 (publication No. 0 377 420) was refused on the grounds that the subject-matters of Claim 1 and of the dependent claims lacked novelty having regard to:

D1: GB-A-1 272 564.
D2: US-A-4 135 900 was also cited in the decision.
D3: US-A-3 914 116 had been cited by the Applicant as the closest prior art after receipt of a communication of the Examining Division.

II. The Appellant (Applicant) lodged an appeal against this decision.

III. In a communication, the Board of Appeal expressed the opinion that the new Claim 1 filed with the Statement of Grounds of appeal did not appear to be clear, and proposed a new specification amended by taking into account the enounced clarity deficiencies and which could be allowable. A copy of D3 with the incorrect drawing as published and a copy of the corresponding US patent application US-B-408 749 with the correct drawing were annexed to the communication.

IV. With letter dated 23 November 1993, the Appellant agreed with the proposed text but for minor amendments concerning an erroneous limitation of the subject-matter which he had made in his submission with the Statement of Grounds of appeal and upon which the Board had based his proposal, and submitted a new set of claims accordingly.

Claim 1 reads as follows:

"1. 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."

Claims 2 to 5 are dependent claims.

V. With letter dated 18 February 1994, the Appellant withdrew additional claims which had been submitted with letter dated 29 November 1993 and which had been objected to by the Board in a further communication.

VI. The Appellant submitted the following arguments:

In the presently claimed device, a fine mesh material on the outlet side of a filter improves the evenness of the air stream at the exit side even if the air flow leaving the filter itself is not even; the even or parallel flow of clean air is necessary at for instance work stations in order not to transport dust and pollution from the side of the work station to the work piece. Known filters of this type have been expensive due to the required precision. The additional filter layers applied in the filters known from D1 or D2 were added in order to improve the structural strength of the filter or to

prevent the collecting of moisture, but not for the present purpose, and they thus include distinguishing features in spite of their similarities; in particular, the transversal elongated rigid beams (28), extending across the surface of the filter known from D2 would provide an undesired swirling enabling dust to be carried into the path of the air leaving the filter. Therefore, the present application is allowable.

Reasons for the Decision

1. The appeal is admissible.

2. *Allowability of the amendments*

The present application, as the original application, concerns an air filter consisting of a zigzag folded filter material having a sheet of an air penetratable fine mesh material placed on the exit side of the air; the present features that the wedge-shaped structure of the filter material and the fine mesh material or other easily air penetratable sheet material with small passages for the air is 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, are also disclosed in the original application (see page 2, lines 10 to 24 and page 2, line 29 to page 4, line 15; the sole Figure). Therefore, the Board is satisfied that the European patent application has not been amended in such a way that it contains subject-matter which extends beyond the

content of the application as filed (Article 123(2) EPC).

3. *Clarity*

Present Claim 1 includes features concerning the structure of the air filter, for instance the direct placing of the fine mesh material or other easily air penetratable material directly after the zigzag filter sheet. As convincingly argued by the Appellant, additional features concern the purpose of the claimed structure and, more particularly the obtention of a very even flow due to the lateral compensation of the multiple multidirectional small flows leaving the zigzag filter, this corresponding to a requirement that no interposed element such as a transversal rigid beam or a transversal elongated rod, which could result in swirling and uneven flow, is included between the filter and the fine mesh. Thus, since Claim 1 correctly defines the structure, it is clear in the sense of Article 84 EPC.

4. *Novelty*

4.1 The Figures of D3 (US-A-3 914 116) as published do not concern the document and an annexed certificate of correction of the US Patent Office mentions this error. The corresponding US patent application (US-B-408 749) indeed contains the relevant drawings. D3 is not mentioned in the communications or in the decision of the Examining Division.

An air filter (6) including a zigzag folded filter sheet (10) forming wedges open alternately towards the inlet (3) and towards the exit side (4) of the filter as filtering material is known from D3 (see, in US-A-3 914 116, column 1, lines 39 to 64; column 2,

line 6 to column 4, line 40; see also, in US-B-408 749, Figures 1 and 2). However, contrary to the air filter of present Claim 1, the known device does not comprise 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.

4.2 As convincingly argued by the Appellant, neither D1 nor D2 is intended for the present purpose and accordingly, they do not disclose all the structural or functional features of the present air filter and are less relevant in spite of similarities. In particular, the transversal elongated rigid beams (28), extending across the surface of the filter known from D2 (see column 1, lines 29 to 49; column 4, line 3 to column 5, line 17; Figures 8 to 10) comprising a pleated media (16) and planar reticulated sheets (130), are directly and unambiguously derivable as having the effect of providing swirling and thus no very even flow, as it is required by the functional limitations in present Claim 1. The air filter of D1 (see the whole document) comprises a first layer of a fabric (22) to which is bonded a layer of glass fibre paper (20) having a water-repellant coating which does not block the interstices or pores of the glass fibre paper, but a function of directional compensation in the air flow through these two layers (20, 22), which are shown as attached layers without intervening space, is not derivable; indeed, layers of foamed synthetic plastics material (18, 16) through which air can pass are bonded to said filter structure, but through a metal reinforcement or grille (14, 24),

which are also directly and unambiguously derivable as causing some swirling and thus no even flow of air through the filter.

4.3 Therefore, the subject-matter of present Claim 1 is novel in the sense of Article 54 EPC.

5. *Inventive step*

5.1 According to the present application (see page 1, first line to page 2, line 24), the air filter of D3 is made by a rectangular zigzag folding of a filter sheet with interposed aluminium distance elements and provides an even flow of clean air. However, it is expensive in the fabrication. The air filter of present Claim 1 credibly solves the problem of obtaining a filter that is less costly but is still usable for appliances where a very even flow is necessary by actually increasing the turbulence after the filter; in particular, a fine mesh material or other easily air penetratable sheet material with small passages for the air is 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.

There is no indication from D3 for placing a fine mesh material at the outside of the filter. It is known from D1 and D2 to provide a further layer having filtering properties or at least openings after the actual filter; however, as credibly submitted by the Appellant, these prior art documents are not concerned with the present problem and, moreover, as mentioned above, interposed transversal elements of the filter do not allow to obtain an even flow of clean air.

Indeed, it could be argued that placing a filtering element downwards of an actual filter is a trivial solution of a trivial problem, for instance insufficient filtering by the actual filter. However, present Claim 1 contains further functional and structural features which are directly related to the solution of the problem of even flow, and which thus result in a selection of the material of the fabric and of its position with respect to the actual filter, for which the prior art does not provide any indication.

5.2 Therefore, the subject-matter of present Claim 1 involves an inventive step in the sense of Article 56 EPC.

5.3 Thus, Claim 1 is allowable (Article 52(1) EPC) and the patent may be granted (Article 97(2) EPC).

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 grant a patent on the basis of the following patent application documents:

Description: Pages 1 to 4, as annexed to the communication of the Board dated 8 October 1993,

Claims: Nos. 1 to 5, as annexed to Applicant's letter dated 23 November 1993, and

Drawings: single sheet (single Figure), as annexed to the communication of the Board dated 8 October 1993.

The Registrar:

P. Martorana

The Chairman:

E. Turrini