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Datasheet for the decision of 1 March 2017

Case Number: T 0421/12 - 3.2.06

Application Number: 03725952.0

Publication Number: 1537301

IPC: F01M13/04, B04B5/08, B04B9/10, B01D45/14

Language of the proceedings: EN

Title of invention:
A METHOD AND A DEVICE FOR CLEANING OF CRANKCASE GAS

Patent Proprietor:
Alfa Laval Corporate AB

Opponent:
MAHLE International GmbH

Headword:

Relevant legal provisions:
EPC 1973 Art. 56, 114(2)

Keyword:
Late-filed document - admitted (no)
Inventive step - (yes)

Decisions cited:

Catchword:

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Case Number: T 0421/12 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 1 March 2017

Appellant: (Patent Proprietor)	Alfa Laval Corporate AB Box 73 221 00 Lund (SE)
Representative:	Alfa Laval Attorneys Alfa Laval Corporate AB Patent Department P.O. Box 73 221 00 Lund (SE)
Respondent: (Opponent)	MAHLE International GmbH Pragstrasse 26-46 70376 Stuttgart (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 1 February 2012 revoking European patent No. 1537301 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	M. Harrison
Members:	M. Hannam
	W. Ungler

Summary of Facts and Submissions

I. An appeal was filed by the appellant (patent proprietor) against the decision of the opposition division revoking European patent No. 1 537 301, in which it found that the subject-matter of claim 1 of the sole request failed to meet the requirement of Article 56 EPC.

II. The appellant requested that the patent be maintained according to a main request or in the alternative according to one of auxiliary requests 1 to 7.

III. The respondent (opponent) requested that the appeal be dismissed.

IV. The following documents are relevant to the present decision:

D1 Richter, Jens, Diplomarbeit "Entwicklung einer Zentrifuge zur Ölnebelabscheidung...", Stuttgart, 1998
D3 DE-A-100 44 615
D9 US-A-2001/0012814

V. The Board issued a summons to oral proceedings and a subsequent communication containing its provisional opinion, in which it indicated *inter alia* that D9 (a document cited by the respondent for the first time in its reply to the grounds of appeal) appeared not to deprive the subject-matter of claim 1 of the main request of novelty as it appeared that none of the embodiments comprising an electric motor drive (as in claim 1 of the patent) would be suitable for cleaning of crankcase gas. It further noted that the subject-matter of claim 1 appeared not to involve an inventive step when starting from D3 in the light of the teaching

of D1. As regards D9, the Board expressed its doubts as to the relevance of D9 for consideration of inventive step to the issue of cleaning a crankcase gas.

VI. With letter of 10 January 2017 the respondent indicated that it would not attend the scheduled oral proceedings.

VII. With its submission of 1 February 2017 the appellant filed replacement auxiliary requests 3 and 4.

VIII. Oral proceedings were held before the Board on 1 March 2017, during which the appellant withdrew all requests save for auxiliary request 4, which became the main request.

The appellant requested that the decision under appeal be set aside and the patent be maintained as amended in the following version:
Description: Pages 2 to 6 filed during the oral proceedings of 1 March 2017.
Claims: No. 1 to 10 filed as a main request during the oral proceedings of 1 March 2017.
Drawings: Figures 1 to 3 of the patent specification.

The respondent requested in writing that the appeal be dismissed.

IX. Claim 1 of the main request reads as follows:

"A device for cleaning of crankcase gas being produced during operation of an internal combustion engine (31) that is arranged for propelling a vehicle (30), said device including
- a centrifugal separator (34) having a centrifugal rotor (8) that is arranged for mounting on the vehicle

and for cleaning of said crankcase gas, and
- an electrical motor (9), which for its operation is connectable to a current source (33) available on the vehicle (30) and which is arranged for rotation of the centrifugal rotor (8), characterized by
- equipment for changing the cleaning efficiency of the centrifugal separator (34), including control equipment (38) arranged for changing the rotational speed of the electrical motor (9) and, thereby, of the centrifugal rotor (8) during maintained operation of the combustion engine (31), and wherein
the device is connectable to a sensor arranged to sense and supply data representative for an actual change of the amount of crankcase gas being produced by the combustion engine (31), the control equipment (38) being arranged to be actuated by data supplied by the sensor."

Claim 8 of the main request reads:

"A method of cleaning crankcase gas produced during operation of an internal combustion engine (31), that is arranged for propelling a vehicle, including
- using a centrifugal separator (34) which has a centrifugal rotor (8), mounted on the vehicle (30), for cleaning of the crankcase gas and
- using an electrical motor (9), which for its operation is connectable to a source of current (33) available on the vehicle (30), for rotation of the centrifugal rotor (8),
characterized by
- changing the separation efficiency of the centrifugal separator (34) by changing the rotational speed of the electrical motor (9) and thereby of the centrifugal rotor (8), while maintaining the combustion engine (31) in operation, and

including changing the rotational speed of the electrical motor (9) by means of data being representative for an actual change of the amount of crankcase gas produced by the combustion engine (31)."

X. The appellant's arguments relevant to the decision may be summarised as follows:

Admittance of D9
This should not be admitted since it was not relevant to the cleaning of crankcase gases and so was unable to provide a hint to a solution to the objective technical problem.

Inventive step
The objective technical problem being addressed by the differentiating features of claim 1 over D3 was as given in para. [0005] of the patent, namely, how to implement the electric motor drive embodiment of D3 so as to improve crankcase gas cleaning. No hint to the claimed solution was provided by D1, as this solely disclosed test results made at separate, different speeds of operation of the centrifuge without any hint at sensing the amount of crankcase gas produced and commensurately controlling the centrifuge speed. The same considerations applied to method claim 8.

XI. The respondent's arguments relevant to the decision may be summarised as follows:

Admittance of D9
This document was highly relevant for the question of inventive step of this request when taken in combination with D3, and should thus be admitted.

Inventive step

The subject-matter of claim 1 differed from claim 1 as granted in that a sensor was provided to detect the change in crankcase gas produced and to enable the speed of the centrifuge to be adjusted accordingly. How this sensor detected the volume of crankcase gas produced was not disclosed in the patent, rather simply a general reference to a bus system for data communication was disclosed. Such a bus system was also known from D9 which thus provided the skilled person with a hint as to how to modify the device of D3 to reach the claimed subject-matter, in particular since the adaptation of the rotational speed for adaptation to cleaning need would imply the use of a sensor.

Reasons for the Decision

Main request

1. *Inventive step*

1.1 D3, which presents the most promising starting point for an inventive step attack, discloses the following features of claim 1 (the references in parentheses referring to D3):
A device (1) for cleaning of crankcase gas being produced during operation of an internal combustion engine (see col. 1, lines 3 to 5) that is arranged for propelling a vehicle, said device including
- a centrifugal separator (1) having a centrifugal rotor (3) that is arranged for mounting on the vehicle and for cleaning of said crankcase gas, and
- an electrical motor (col. 5, lines 42 to 43), which for its operation is connectable to a current source (implicit) available on the vehicle and which is arranged for rotation of the centrifugal rotor (3, see

Fig. 1).

1.2 The subject-matter of claim 1 is thus differentiated from D3 by the device further comprising:
- equipment for changing the cleaning efficiency of the centrifugal separator, including control equipment arranged for changing the rotational speed of the electrical motor and, thereby, of the centrifugal rotor during maintained operation of the combustion engine, the device being connectable to a sensor arranged to sense and supply data representative for an actual change of the amount of crankcase gas being produced by the combustion engine, the control equipment being arranged to be actuated by data supplied by the sensor.
By means of these features, specific limitations are put on the structure of the control equipment such that it is actuated by a sensed amount of crankcase gas.

1.3 These differentiating features have a combined technical effect of altering the cleaning efficiency of the separator according to the amount of crankcase gas produced. The objective technical problem to solve when starting from D3 may therefore be seen as how to implement the electrical motor embodiment of D3 so as to improve crankcase gas cleaning.

1.4 *Admittance of D9*

1.4.1 This document was not in proceedings before the opposition division and was introduced by the respondent in its letter of response to the proprietor's appeal. Its admittance is thus to be considered under Article 114(2) EPC 1973. In this respect it is necessary to consider whether D9 is more relevant than documents currently on file insofar as it could change the Board's conclusion regarding the

presence of an inventive step in the subject-matter of claim 1.

1.4.2 As identified in point 1.3 above, when starting from D3 which includes no detail whatsoever regarding the control of the electrical motor (see col. 5, lines 42 to 43 of D3), the objective technical problem involves an improvement in crankcase gas cleaning. D9 is however unsuited to the cleaning of crankcase gases (see in particular paragraph [0003] identifying its application to filtering of liquids rather than a crankcase gas and Fig. 29 showing numerous paths via which a gas would bypass the filter element and thus not be cleaned); it would thus be immediately evident to the skilled person that the embodiments of D9 would manifestly fail to clean crankcase gases. As a consequence the skilled person would not consider D9 as providing a hint to the objective problem when starting from D3, as this requires an improvement in crankcase gas cleaning.

1.4.3 Furthermore, the Board's provisional opinion questioned whether an assembly for filtering particulates from liquids, as disclosed in D9, could provide a hint to modifying a device suited to crankcase gas cleaning. To this opinion the respondent failed to provide any reply. The Board thus sees no reason to change its provisional opinion in this respect.

1.4.4 Therefore, lacking relevance regarding the subject-matter of claim 1 involving an inventive step, D9 is not admitted under Article 114(2) EPC 1973.

1.5 *D3 + technical teaching of D1*

1.5.1 When starting from D3 and wishing to solve the objective technical problem, D1 also fails to provide

the skilled person with a hint as to how to modify D3 in order to meet the claimed subject-matter. D1 discloses (e.g. page 20, last paragraph) varying the rotational speed at which the centrifugal separator can be operated and, particularly in Table 8.5 on page 42, indicates the different cleaning efficiencies resulting at individual separate speeds ranging from 2000 to 7000 rpm of the separator. However, D1 fails to provide any hint to control the cleaning efficiency dependent upon the amount of crankcase gas being produced by an engine. No sensors or similar detecting devices are disclosed in D1 for communicating a change in the amount of crankcase gas, such that no control function of the rotational speed in dependence of such measurement is possible. Instead D1 merely provides a teaching that at higher rotational speeds, increased efficiency of the centrifugal separator is to be expected (as does D3 - see col. 1, line 68 to col. 2, line 2).

1.5.2 The subject-matter of claim 1 thus involves an inventive step when starting from D3 and taking account of the teaching of D1 in light of the objective technical problem to be solved.

1.5.3 No further arguments are on file which would put inventive step of the subject-matter of claim 1 into doubt. The Board also finds no reason itself as to why the subject-matter of claim 1 lacks an inventive step. The subject-matter of claim 1 is thus found to meet the requirement of Article 56 EPC 1973.

1.5.4 Regarding independent method claim 8, this is differentiated from the disclosure of D3 by the features in the characterising portion of the claim:
- changing the separation efficiency of the centrifugal

separator by changing the rotational speed of the electrical motor and thereby of the centrifugal rotor, while maintaining the combustion engine in operation, and
including changing the rotational speed of the electrical motor by means of data being representative for an actual change of the amount of crankcase gas produced by the combustion engine.

It is noted that these features are method features corresponding to those device features differentiating claim 1 from D3.

1.5.5 The differentiating method features define how a change in the amount of crankcase gas will result in a controlled change in the centrifuge speed. The objective technical problem to solve when starting from D3 may therefore be seen, similarly to that for claim 1 above, as how to operate the electrical motor embodiment of D3 so as to improve crankcase gas cleaning.

1.5.6 With the differentiating method features of claim 8 corresponding to the differentiating device features of claim 1, with the same objective technical problem to solve and with the same arguments on file for both the method and the device claims with respect to the question of inventive step, the Board finds similarly to claim 1 above, that the subject-matter of claim 8 also involves an inventive step over all document combinations and related arguments presented by the respondent. The requirement of Article 56 EPC 1973 is thus met.

1.5.7 The description was adapted to be in accordance with the subject-matter of the amended claims of the present

request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent as amended in the following version:
   Description: Pages 2 to 6 filed during the oral proceedings of 1 March 2017.
   Claims: No. 1 to 10 filed as a main request during the oral proceedings of 1 March 2017.
   Drawings: Figures 1 to 3 of the patent specification.

The Registrar: The Chairman:

C. Spira M. Harrison

Decision electronically authenticated