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Anmeldenummer / Filing No / N° de la demande : 82 402 062.2

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Bezeichnung der Erfindung: Hydraulic operated fan assembly for a heat exchanger
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : F01P 5/04, F01P 7/08

ENTSCHEIDUNG / DECISION
vom / of / du 12 July 1988

Anmelder / Applicant / Demandeur : Clemente, Roger

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 56, Rule 29(1)

Schlagwort / Keyword / Mot clé : Inventive step (yes);
Two-part form of an independent claim
(not appropriate)

Leitsatz / Headnote / Sommaire

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Case Number : T 120/86 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 12 July 1988

Appellant : Clemente, Roger
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Representative : Hoisnard, Jean-Claude
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Decision under appeal : Decision of Examining Division 101 of the European Patent Office dated 11 December 1985 refusing European patent application No. 82 402062.2 pursuant to Article 97(1) EPC

Composition of the Board :

Chairman : C. Maus
Members : H. Seidenschwarz
P. Ford

Summary of Facts and Submissions

I. European patent application No. 82 402 062.2, filed on 10 November 1982, published under publication number 0 079 829 and claiming the priority of a previous application of 13 November 1981, was refused by a decision of the Examining Division 101 on 11 December 1985. The decision was based on Claims 1 and 2 received on 28 September 1984.

II. The reason given for the refusal was lack of inventive step of the subject-matter of Claim 1 in view of GB-A-1 031 962 and FR-A-2 476 208.

III. On 6 February 1986, the Appellant filed an appeal against the decision and paid the fee. The Statement of Grounds was received on 29 March 1986.

No statement expressly identifying the extent to which amendment or cancellation of the impugned decision is requested was submitted within the time-limit for appeal.

IV. During the procedure before the Board, the Appellant submitted on 27 June 1988 new Claims 1 and 2, new pages 1 to 8 and a new drawing.

V. Claim 1 reads as follows:

"A fan assembly (16) for a heat exchanger assembly (10) associated with a vehicle having an internal combustion engine, wherein a heat transfer fluid is passed through said heat exchanger assembly (10), which comprises:

- a hydraulic motor (20) including a drive shaft (46) mounted proximate said heat exchanger assembly (10);

- a fan (56) mounted on said drive shaft (26) of said hydraulic motor (20);

- a hydraulic pump (18) including a shaft (26) mounted proximate said internal combustion engine;

- fluid conduit means (22), (24) including a reservoir (25) disposed between said hydraulic pump (18) and said hydraulic motor (20);

- means (38, 40, 42, 44) for driving said hydraulic pump (18) by said internal combustion engine and comprising an electrically operated magnetic clutch assembly (36) disposed on said shaft (26) of said hydraulic pump (18); and

- a switch means (64) responsive to a preselected condition to assume an operative mode to activate said electrically operated magnetic clutch assembly (36) thereby to cause said shaft (26) of said hydraulic pump (18) to rotate and effect fluid flow of hydraulic fluid from said hydraulic pump (18) to said hydraulic motor (20) thereby to rotate said fan (56)."

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106-108 and Rule 64(a) EPC. The appeal also complies with Rule 64(b) which stipulates that the notice of appeal shall identify the extent to which amendment or cancellation of the impugned decision is requested. The content of the impugned decision is purely and simply the refusal of the last version of the European patent application then ruling. The formulation "The claimant hereby appeals

against the decision" is therefore to be interpreted as meaning that the setting-aside of a decision in its entirety and the grant of the European patent with the final documents of the European patent application is being sought (cf. T 07/81 OJ EPO, 1983, 98). The appeal is therefore admissible.

2. Claim 1 corresponds to Claim 1 as filed, whereas dependent Claim 2 comprises a combination of the features mentioned in the dependent Claims 2 and 4 as filed.

Hence, the subject-matter of the claims does not extend beyond the content of the application as filed (Article 123(2) EPC).

3. The invention concerns a fan assembly for a heat exchanger assembly associated with a vehicle having an internal combustion engine, wherein a heat transfer fluid is passed through the heat exchanger assembly.

The cooling fan control known from GB-A-1 031 962 is the closest to the subject-matter of Claim 1 among the multiple fan assemblies for cooling internal combustion engines according to the prior art documents cited in the search report. This known assembly, however, comprises two hydraulic motors and two fans driven by the hydraulic motors, a hydraulic pump driven from a diesel engine, and fluid conduit means including a reservoir. Further, the assembly includes a means for deriving a plurality of temperature related control magnitudes to control the fans.

From this follows that the Board of Appeal has come to the conclusion that the fan assembly as defined in Claim 1 is not disclosed in any one of the prior art documents.

The subject-matter of Claim 1 is, therefore, novel having regard to this state of the art.

4. On the question of whether or not the teachings disclosed in GB-A-1 031 962 and FR-A-2 476 208 would suggest the fan assembly according to Claim 1, the following should be observed:

4.1 In known hydraulic driven fan assemblies the hydraulic pumps are running continuously during the operation of the engine. This results in a waste of energy and an unnecessary wear and tear of the hydraulic system.

4.2 The technical problem, when objectively assessed in the light of the prior art, is to provide a fan for a heat exchanger assembly associated with a vehicle having an internal combustion engine, wherein a heat transfer fluid is passed through said heat exchanger assembly, which fan assembly permits to increase the efficiency of the whole assembly by saving energy, reducing unnecessary wear of the hydraulic pump and placing the heat exchanger in any position with respect to the engine.

4.3 From GB-A-1 031 962 the person skilled in the art learns to drive hydraulically the fans for two independent cooling circuits by a common pump and to control the fans by a common cooling fan control arranged in a pipe of the fluid conduit means, which pipe by-passes the fans. The hydraulic pump driven from the shaft of the diesel engine is continuously in operation when the diesel engine is running. In case the temperatures of the heat transfer fluids of both cooling circuits are below predetermined values the hydraulic pump feeds hydraulic fluid into the fluid conduit means and via the by-pass pipe back to the reservoir. The fans are inoperative. If the temperatures of the heat transfer fluids attain the predetermined value the

cooling fan control wholly or partly closes the by-pass pipe, so that the hydraulic fluids are fed wholly or partly to the hydraulic motors of the fans. In this case the fans are in operation (see page 2, lines 38 to 44, 87 to 89, 110 to 120; page 4, lines 18 to 53).

In this document, there are, therefore, no indications to increase the efficiency of the assembly by controlling the drive of the hydraulic pump depending on a preselected condition of each cooling circuit.

4.4 FR-A-2 476 208 concerns an electrically operated magnetic switch for a fan assembly for a heat exchanger assembly associated with a vehicle having an internal combustion engine, wherein a heat transfer fluid is passed through the heat exchanger assembly.

The clutch is disposed between a driving pulley and the fan. These means are arranged on the same shaft. The engine drives continuously the shaft by a belt drive.

As soon as the engine has started up and during the heating up of the latter, the fan is initially in its disengaged position. When the temperature of the heat transfer fluid, however, has passed a predetermined value the driving element of the clutch is activated and the driven element of the clutch puts into operation the fan (see page 2, line 31 to page 3, line 4; page 3, lines 8 to 12, 30 to 33; page 4, lines 5 to 16).

The teaching derived from this document is to dispose an electrically operated magnetic clutch assembly on a continuously driven shaft between the driving means of said shaft and the fan.

4.5 The person skilled in the art knows that clutches are generally used to interrupt and to restore the transmission of torque during the running of a machine. He knows also, that a non-running machine does not consume any energy. However, also in view of this general knowledge, the person skilled in the art would only learn from FR-A-2 476 208 to dispose in a hydraulic driven fan assembly according to GB-A-1 031 962 an electrically operated clutch assembly on the shafts between the hydraulic motors and the fans mounted on said shafts.

4.6 The teachings of the documents GB-A-1 031 962 and FR-A-2 476 208, i.e. to drive continuously the shaft of a hydraulic pump or of a fan which requires a by-pass pipe or an electrically operated clutch assembly on the shaft of the fan, do not, therefore, give any suggestion to dispose the clutch on the shaft of a hydraulic pump and to activate the clutch in such a manner that the shaft is rotated only when necessary, thus increasing the efficiency of the whole fan assembly having regard to the consumption of energy and material as well as to the most suitable position of the fan assembly with respect to the engine.

4.7 The devices disclosed in the other documents cited in the search report do not come closer to the subject-matter of Claim 1 than those mentioned above. Even taking their teachings into account, they could not lead the person skilled in the art to the fan assembly according to Claim 1.

4.8 Hence, in the Board's judgement the subject-matter of Claim 1 involves an inventive step within the meaning of Article 56 EPC.

5. Consequently, Claim 1 and Claim 2, which is directed to a special embodiment of the subject-matter of Claim 1, are allowable.

6. Rule 29(1) EPC stipulates that claims should normally be formulated in two parts. However, as provided by Rule 29(1), second sentence, this two-part formulation need be used only in appropriate cases. In the present case, the Board considers that the two-part formulation would only give a misleading picture of the prior art. For this reason, a two-part claim is not appropriate.

7. The description is adapted to the wording of the claims ad indicates the information concerning the prior art to be contained according to Rule 27(1)(c) EPC. Furthermore, the technical problem to be solved by the subject-matter of Claim 1 is represented more clearly. The amendments are, therefore, not open to objection.

Order

For these reasons, it is decided that:

1. The decision made under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a European patent on the basis of the following documents:

Claims 1 and 2, received on 27 June 1988,
Description, pages 1 to 8, received on 27 June 1988,
Drawing comprising Figures 1 and 2, received on 27 June 1988.

The Registrar: The Chairman:

S. Fabiani C. Maus