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**Datasheet for the decision
of 22 July 2025**

Case Number: T 1009/23 - 3.2.08

Application Number: 18158324.6

Publication Number: 3530989

IPC: F16H57/04

Language of the proceedings: EN

Title of invention:

ARRANGEMENT COMPRISING AN ELECTRIC MACHINE AND A GEARBOX AND
VEHICLE

Patent Proprietor:

Valeo eAutomotive Germany GmbH

Opponent:

ZF Friedrichshafen AG

Relevant legal provisions:

EPC Art. 56

Keyword:

Inventive step - (yes)



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 1009/23 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 22 July 2025

Appellant: Valeo eAutomotive Germany GmbH
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
29 March 2023 concerning maintenance of the
European Patent No. 3530989 in amended form.**

Composition of the Board:

Chairwoman P. Acton
Members: M. Foulger
C. Schmidt

Summary of Facts and Submissions

I. With the decision posted on 29 March 2023, the opposition division decided that the patent and the invention to which it related, in the form according to the second auxiliary request, met the requirements of the EPC.

The opposition was based on the ground of opposition according to Article 100(a) EPC. The opposition division found that the subject-matter of claim 1 as granted did not involve an inventive step.

II. The patent proprietor and the opponent filed appeals against this decision.

III. The patent proprietor requested that the decision under appeal be set aside, that the opponent's appeal be dismissed and that the patent be maintained as granted (main request), or that the patent be maintained on the basis of auxiliary request 1, filed with the proprietor's statement setting out its grounds of appeal dated 31 July 2023, auxiliary requests 2 to 17, filed with the proprietor's reply to the opponent's appeal dated 29 December 2023 or auxiliary request 1a, filed with letter dated 18 July 2025. The patent proprietor stated that the auxiliary requests should be examined in the order of their numbering, i.e. 1, 1a and 2 to 17.

IV. The appellant (opponent) requested that the patent be revoked.

V. The following documents have been referred to in appeal proceedings:

D4: DE 10 2013 104 711 A

D5: DE 197 45 616 A

D6: DE 10 2015 214 309 A

D10: JP 5983505 B

D13: DE 10 2015 217 875 A

D16: DE 10 2015 218519 A

D22: "Maschinenelemente 2", Bafög-Ausgabe, Schlecht, 2017, ISBN 978-3-8632-68251

VI. Claim 1 as granted reads:

F1 Arrangement (1) comprising

F1.2 an electric machine (2),

F1.3 a gearbox (3),

F1.3.1 a shaft (9) coupling the electric machine (2) with the gearbox (3) and

F1.3.2 having an axial blind bore (18),

F1.4 a coolant insertion element (21)

F1.4.1 configured to supply a coolant into the bore (18) and

F1.5 a coolant conduction element (22)

F1.5.1 being arranged such that the shaft (9) rotates around it and

F1.5.3 defining a flow path (23) for the inserted coolant,

characterized in that

F1.3.3 the bore (18) extends from a machine-side end of the shaft into the gearbox (3), and

F1.5.2 that the coolant conduction element extends inside the bore (18) from the machine-side end (19) into the gearbox (3)."

Feature designation added by the Board.

VII. The essential arguments of the parties are summarised in the Reasons for the Decision below.

Reasons for the Decision

1. Inventive step - starting from D10 as closest prior art

It was undisputed that D10 did not disclose features F1.3.2 and F1.3.3 because the shaft (35, 251) was split into two.

The appellant (opponent) identified two possible problems solved by these differentiating features:

- a) to provide an alternative arrangement to D10
- b) to apply the cooling concept of D10 to a simpler arrangement.

According to the appellant (opponent), providing a single shaft was a well known and obvious alternative to the split shaft arrangement shown in D10. They referred to D4, D5 and D6 to show that this was indeed a well known arrangement. The skilled person would therefore apply the single shaft to the arrangement known from D10 and thereby arrive at the subject-matter without the exercise of inventive activity.

The Board considers that the skilled person would not depart from the teaching of D10. In D10, the two sides 36 and 27 of the power split mechanism 11 rotate at different speeds. This is necessary for the operation of the transmission, which can either use an internal combustion engine or an electric motor as the prime mover. Thus, the arrangement of D10 would not function using a single shaft and this modification is consequently not obvious for the skilled person.

With regard to the second problem, the Board considers that the cooling concept of D10 involves the cooling fluid leaking out from the gap between the two shafts. This means that the cooling concept of D10 is inextricably linked with an arrangement comprising two shafts. Therefore, applying the cooling concept of D10 to simpler arrangements would still lead to a system with two shafts and not to the subject matter of claim 1.

2. Inventive step - starting from D13 as closest prior art

It is common ground that D13 does not disclose features 1.3.3 and 1.5.2 of claim 1 because the cooling passages do not extend into the gearbox part of the arrangement.

The appellant (opponent) argued that the problem to be solved was to ensure an adequate cooling of the gearbox. To solve this problem, it would have been obvious for the skilled person to extend the cooling channels in the shaft into the gearbox, either on the basis of their common general knowledge as shown e.g. in D22 or in combination with the teaching of D16. They argued that D16 showed that the shaft does not need to be a uniform thickness.

To support their formulation of the objective technical problem, the appellant (opponent) referred to the contested patent, paragraph [0007], according to which "[i]t is an object of the invention to provide an improved arrangement comprising an electric machine and a gearbox, particularly allowing an improved heat dissipation from the gearbox." This would also motivate the skilled person to modify the shaft of D13.

The Board does not agree with this argumentation

because it already starts from a knowledge of the solution described in the patent. In the Board's opinion the analysis must start with the disclosure of the prior art and the differences between the subject-matter of the claim and the prior art. With this in mind, it must then be established what problem is solved by the differences and how the skilled person would have solved it. The Board notes that the gearbox part of the arrangement shown in Fig. 3 of D13 is a sealed compartment with oil seals on the shaft. Thus D13 already has an oil cooling for the gears. Therefore, the skilled person would not have had any incentive to modify the shaft's geometry in order to achieve the cooling of the gears. It is thus not evident that the problem suggested by the appellant (opponent) would apply to the arrangement disclosed in D13.

The Board therefore comes to the conclusion that the skilled person could, but would not, arrive at the subject-matter of claim 1 because they would not recognise that it was necessary or desirable to cool the shaft in the gearbox area of the arrangement of D13.

Also, D16 teaches having a fixed hollow tube containing cooling fluid in the centre of the shaft which is surrounded by fluid. The cooling fluid in the tube 6 must enter at one end of the tube and exit at the other end. This arrangement is incompatible with a blind bore as claimed (feature 1.3.2).

Therefore, the subject-matter of claim 1 as granted involves an inventive step when starting from D13 irrespective of whether this document is considered on its own or in combination with the common general

knowledge as shown in D22 or in combination with the teaching of D16.

3. Starting from D4 as closest prior art

According to the appellant (opponent) D4 does not show features 1.3.3 and 1.5.2:

F1.3.3 the bore (18) extends from a machine-side end of the shaft into the gearbox (3), and

F1.5.2 that the coolant conduction element extends inside the bore (18) from the machine-side end (19) into the gearbox (3).

The Board agrees with this and, indeed, Fig. 1 shows the fluid coming from the gearbox side (left in the figure).

The appellant (opponent) argues that the skilled person would have recognised that the arrangement of D13 provided advantages in having the cooling supplied from the machine side rather than gearbox side. They would have applied this teaching to the arrangement of D4.

Paragraph [0035] of D4, referred to by the appellant (opponent), states that oil serves primarily for heat transfer from the rotor of the electric machine to a cooling medium. The oil which comes from the gearbox is supplied via an oil input 24 into the cooling lance (D4, paragraph [0030]). The cooling lance is fed additionally with a cooling medium, which can be water, see paragraph [0028].

As it is the gearbox oil that is used for heat transfer, it has to be provided directly from the gearbox as is done in D4. Therefore, as the oil feed needs to come from the gearbox side, it would be

logical for the skilled person to also take the coolant feed from the gearbox side, in order to avoid having fluid connections on both ends of the shaft.

Thus, starting from D4 as closest prior art the skilled person would have had no motivation, that would have incited them to modify the arrangement known from D4 to arrive at the subject-matter of claim 1 even taking D13 into account.

Hence, the subject-matter of claim 1 also involves an inventive step starting from D4 as closest prior art.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is maintained as granted.

The Registrar:

The Chairwoman:



C. Moser

P. Acton

Decision electronically authenticated