Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 24 May 2024

Case Number: T 1867/21 - 3.2.08

Application Number: 08712749.4

Publication Number: 2257722

IPC: F16H59/66, F16H61/02, B60T7/12

Language of the proceedings: EN

Title of invention:
A METHOD AND DEVICE FOR AUTOMATIC OR SEMIAUTOMATIC SELECTION OF A BETTER STARTING GEAR IN A VEHICLE

Patent Proprietor:
Volvo Lastvagnar AB

Opponent:
Scania CV AB

Relevant legal provisions:
EPC Art. 56, 84
RPBA 2020 Art. 12(4)

Keyword:
Inventive step - main request (no)
Claims - clarity - auxiliary requests (no)
Amendment to case - amendment admitted (yes)

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1867/21 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 24 May 2024

Appellant: (Opponent)	Scania CV AB 151 87 Södertälje (SE)
Representative:	Thum, Bernhard Thum & Partner Thum Mötsch Weickert Patentanwälte PartG mbB Siebertstr. 6 81675 München (DE)
Respondent: (Patent Proprietor)	Volvo Lastvagnar AB 405 08 Göteborg (SE)
Representative:	Valea AB Box 1098 405 23 Göteborg (SE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 11 August 2021 concerning maintenance of the European Patent No. 2257722 in amended form.**

Composition of the Board:

Chairwoman	P. Acton
Members:	C. Vetter
	C. Schmidt

Summary of Facts and Submissions

I. The appeal was filed by the opponent (appellant) against the interlocutory decision of the opposition division finding that, on the basis of the amended main request then on file, the patent in suit met the requirements of the EPC.

II. The opposition division had decided, *inter alia*, that the subject-matter of the claims of this request involved an inventive step.

III. Oral proceedings were held before the Board.

IV. The appellant (opponent) requested that the decision under appeal be set aside and that the patent in suit be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed and the patent be maintained as considered allowable by the opposition division (main request), or, in the alternative, that the patent be maintained according to the first or the second auxiliary request which it had filed with the reply to the appeal on 4 April 2022, or according to the third auxiliary request filed with its letter of 5 May 2023.

V. Claim 1 of the main request reads as follows (feature numbering added by the board):

> **1.1** A method for automatic selection of a better starting gear in a vehicle, comprising the following steps executed in mentioned order:
> **1.2** - selecting either manually or by means of a control unit (7) a first vehicle starting gear at

vehicle stand still (S2, S32), the following steps being performed by said control unit (7):
1.2' - engaging said first vehicle starting gear at vehicle stand still,
1.3 - on driver demand controlling vehicle propulsion torque in such a way as to attempt to achieve a first vehicle take off (S3, S33),
1.4 - detecting if said first vehicle starting gear is too high for a prevailing condition of the first vehicle take off (S4, S34),
1.5 - if the first vehicle starting gear is too high then interrupting the first vehicle take off
1.6 and braking the vehicle (S6, S36) by activating a braking device (6),
1.7 - disengaging said first vehicle starting gear (S7, S37),
1.8 - selecting and engaging a second starting gear which is a lower gear compared to said first starting gear and having a higher gear ratio (S8, S38),
1.9 - controlling vehicle propulsion torque in such a way as to attempt to achieve a second vehicle take off,
1.10 - and if said second vehicle take off attempt results in a transmitting of torque to driven wheels of the vehicle being enough as to perform a take off then stop braking the vehicle (S9, S39).

Claim 1 of the first auxiliary request differs from claim 1 of the main request in amended feature **1.8-Aux1**, which requires (key amendments highlighted):

1.8-Aux1 - selecting and engaging a second starting gear from a plurality of gears which are lower gears compared to said first starting gear and having higher gear ratios (S8, S38), said

selection being dependent on how bad the first vehicle take off was.

Claim 1 of the second auxiliary request differs from claim 1 of the main request in amended features **1.4-Aux2** and **1.8-Aux2**, which require (key amendments highlighted)

1.4-Aux2 - detecting if said first vehicle starting gear is too high for a prevailing condition of the first vehicle take off (S4, S34) by calculating heat energy developed in the clutch during the first vehicle take off attempt,
1.8-Aux2 - selecting and engaging a second starting gear from a plurality of gears which are lower gears compared to said first starting gear and having higher gear ratios (S8, S38), said selection being decided by the control unit being programmed to calculate said heat energy during clutch slip and register the rotational speed of an input shaft of the gearbox in the transmission, with the lower the rotational speed of the input shaft, the lower the second starting gear that is selected.

Claim 1 of the third auxiliary request differs from claim 1 of the first auxiliary request in amended feature **1.8-Aux3**, which requires (key amendments highlighted)

1.8-Aux3 - selecting and engaging a second starting gear from a plurality of gears which are lower gears compared to said first starting gear and having higher gear ratios (S8, S38), said control unit having been programmed to interpret how bad the first vehicle take off attempt was,

with said selection being dependent on how bad the first vehicle take off was.

VI. In the present decision, reference is made to the following documents:

D2: WO 02/42108 A1
D5: US 2006/0079377 A1
D17: US 6,679,810 B1

VII. The arguments of the parties relevant to the decision are set out below in the Reasons for the Decision.

Reasons for the Decision

1. Admittance of D17

1.1 Document D17 was filed with the statement setting out the grounds of appeal as a combination document for the assessment of inventive step.

1.2 The respondent argued that D17 could have been filed during the proceedings before the opposition division and that it was not more relevant than D5.

1.3 It is true that D17 could have been filed during the proceedings before the opposition division.

However, D17 was not filed as an entirely new attack. In fact, it was submitted as a document to be considered in combination with a closest-prior-art document, namely D2, which is already discussed in paragraph [0002] of the patent in suit. D17 therefore only served to supplement an objection which was already known to the respondent.

D17 pertains to a hill holder device for a motor vehicle. It describes a scenario of a take-off attempt that is unsuccessful, either because it takes too long or because the clutch becomes too hot (D17, column 8, lines 22 to 39; Figure 2). D17 thereby not only goes beyond the teachings of D5, it also addresses a similar scenario to that described in the patent in suit as well as in the closest prior art (D2, page 9, lines 3 to 6). D17 is thus, *prima facie*, highly relevant.

1.4 The Board therefore exercised its discretion and admitted document D17 into the proceedings under Article 12(4) RPBA 2020.

2. Main request - inventive step

2.1 It was undisputed that document D2 discloses on page 9, lines 3 to 8 (references in brackets refer to D2):

> **1.1** A method for automatic selection of a better starting gear in a vehicle, comprising the following steps executed in mentioned order:
> **1.2** - selecting either manually or by means of a control unit (28) a first vehicle starting gear at vehicle stand still, the following steps being performed by said control unit (28):
> **1.2'** - engaging said first vehicle starting gear at vehicle stand still,
> **1.4** - detecting if said first vehicle starting gear is too high for a prevailing condition of the first vehicle take off,
> **1.5** - if the first vehicle starting gear is too high then interrupting the first vehicle take off, and

1.7 - disengaging said first vehicle starting gear.

2.2 With respect to feature **1.8**, D2 discloses on page 9, lines 6 and 7, that

> the system 10 will force a downshift making that new lower gear the maximum starting gear.

In the respondent's view, the fact that the system *forced* a downshift did not necessarily mean that the control unit performed the selecting and engaging of the lower gear. It could - according to the respondent - be that something else or someone else ultimately selected and engaged the gear, for example the driver.

Engaging a gear is a physical action which involves physical means. Also in the claimed invention it is not the control unit itself that effects the engagement of the gear. Instead, there is some form of intermediate physical means which is *controlled* by the control unit to perform the downshift.

In D2, the physical means for performing the downshift is *forced* by the system to do so, which means that there is no room for any deviation from the command of the system. Accordingly, also in D2 it is effectively the control unit that performs the selecting and engaging of a lower starting gear within the meaning of the claimed invention. Therefore, D2 also discloses feature **1.8**, i.e.

1.8 - selecting and engaging a second starting gear which is a lower gear compared to said first starting gear and having a higher gear ratio.

2.3 Regarding features **1.3** and **1.9**, it was common ground that both in the claimed invention and in D2 the vehicle propulsion torque was controlled by controlling the clutch.

In this respect, D2 discloses on page 9, lines 3 and 4, that the driver tries to start the vehicle from rest in the chosen allowed starting gear. This implies controlling the clutch.

However, according to the respondent, feature **1.1** of the claimed invention required steps **1.3** and **1.9** to be performed by the *control unit*, while in D2 it was the *driver* who operated the clutch, at least when starting the vehicle from a standstill.

It was common ground that in the automated manual transmission (AMT) described in D2 the clutch could be opened and closed automatically if the vehicle was moving. Otherwise, as correctly stated by the respondent, the system described in D2 would not work. This understanding of the disclosure of D2 is in line with the general operating principle of AMTs and is also supported by D2 itself. The latter states on page 5, lines 16 and 17, that the master clutch may be controlled by a clutch actuator responding to output signals from the electronic control unit 28.

Therefore, the only conceivable difference between the claimed method and the disclosure of D2 is that the clutch operation is also performed by the control unit during the first and second vehicle take-off attempts from *standstill* according to features **1.3** and **1.9**.

However, even if it were accepted that this is not directly and unambiguously derivable from D2, the first

partial objective technical problem could only be seen in automating this task.

While it is true that D2, page 8, line 8, teaches that the master clutch is still driver-operated, the skilled person would be motivated to extend the degree of automation in order to minimise driveline shock caused by clutch popping as mentioned on page 8, line 4 of D2. Consequently, since the clutch in D2 can already be opened and closed automatically when the vehicle is moving, it would be obvious to the skilled person to also provide this functionality for operating the clutch when the vehicle is stationary.

2.4 It was undisputed that the claimed method differs from the disclosure of D2 in steps **1.6** and **1.10**, which require

> **1.6** braking the vehicle by activating a braking device,
> **1.10** and if said second vehicle take off attempt results in a transmitting of torque to driven wheels of the vehicle being enough as to perform a take off then stop braking the vehicle.

These features have the technical effect of allowing the starting-gear change to be performed on a slope without risking the vehicle rolling away in the wrong direction. Undoubtedly, this is a safety issue.

The second partial objective technical problem to be solved can therefore be formulated as the increasing of operational safety, as suggested by the respondent.

2.5 D17 pertains to handling a starting operation of a vehicle (D17, column 1, lines 27 to 31) and teaches a

hill holder, i.e. an automatically actuated brake for starting a vehicle on a hill (D17, column 9, lines 30 to 31). According to column 2, lines 16 to 19, of D17 the hill holder is advantageous, among other things, for vehicles having electronically controlled clutch arrangements, which covers the vehicular automated manual transmission system of D2.

Figure 2 of D17 describes a scenario of a take-off attempt. If the attempt is unsuccessful, either because it takes too long (step 24) or because the clutch becomes too hot (column 8, lines 31 to 39), the hill holder, i.e. brake, is activated. Hence, D17 teaches the logic of features **1.5** and **1.6**, namely

> **1.5** if the first vehicle starting gear is too high then interrupting the first vehicle take off
> **1.6** and braking the vehicle by activating a braking device.

D17 further teaches in column 10, lines 33 to 47, that the brake is opened once the torque to driven wheels of the vehicle is sufficient for a take-off to be performed, which is the logic of feature **1.10**.

2.6 In order to solve the above-formulated second partial objective technical problem and to prevent the vehicle from rolling away when the take-off attempt is interrupted, the skilled person would have applied the teachings of D17 to the method of D2.

2.7 As a consequence, the claimed method was obvious to the skilled person starting from D2 in combination with their common general knowledge and the teachings of D17. The main request does not therefore meet the requirements of Article 56 EPC.

3. First auxiliary request - clarity

3.1 Claim 1 of the first auxiliary request contains an amended feature **1.8-Aux1**, which requires (key amendments highlighted):

> **1.8-Aux1** - selecting and engaging a second starting gear from a plurality of gears which are lower gears compared to said first starting gear and having higher gear ratios (S8, S38), said selection being dependent on how bad the first vehicle take off was.

3.2 The key aspect of the amended feature is that the selection of the second starting gear depends on "how bad" the first vehicle take-off attempt was.

The respondent argued that the relative expression "how bad" should be interpreted in the sense of "how much torque was missing" or "how large the deficiency in torque was".

However, the term "bad" has a much broader meaning and is not restricted to the amount of missing torque. As the appellant has rightly pointed out, the term "bad" could even be seen as a subjective term covering arbitrary criteria. It is not clear which of these criteria are to be considered for the selection of the second starting gear as required by the claim.

3.3 Therefore, amended claim 1 of the first auxiliary request is not clear within the meaning of Article 84 EPC. Therefore, the first auxiliary request is not allowable.

4. Second auxiliary request - clarity

4.1 Claim 1 of the second auxiliary request contains an amended feature **1.8-Aux2**, which requires (key amendments highlighted):

> **1.8-Aux2** - selecting and engaging a second starting gear from a plurality of gears which are lower gears compared to said first starting gear and having higher gear ratios (S8, S38), said selection being decided by the control unit being programmed to calculate said heat energy during clutch slip and register the rotational speed of an input shaft of the gearbox in the transmission, with the lower the rotational speed of the input shaft, the lower the second starting gear that is selected.

4.2 The key aspects of amended feature **1.8-Aux2** are that the rotational speed of an input shaft of the gearbox in the transmission is registered, and that the selection of the second starting gear follows the logic that "the lower the rotational speed of the input shaft, the lower the second starting gear that is selected".

4.3 The claim does not specify the point in time at which the rotational speed is registered. If the registration is assumed to be a continuous process, the claim does not specify which of the registered values forms the basis for the claimed logic.

4.4 As correctly stated by the respondent, the most significant value of the rotational speed could be obtained at the point in time at which the first take-off attempt is interrupted.

However, the claim is not restricted to this. Indeed, the claim covers the rotational speed of the input shaft at any arbitrary point in time being used as the basis for the claimed logic.

4.5 Consequently, amended claim 1 of the second auxiliary request is not clear within the meaning of Article 84 EPC and is therefore not allowable either.

5. Third auxiliary request - clarity

5.1 Claim 1 of the third auxiliary request differs from claim 1 of the first auxiliary request in further amended feature **1.8-Aux3**, which requires (key amendments highlighted)

> **1.8-Aux3** - selecting and engaging a second starting gear from a plurality of gears which are lower gears compared to said first starting gear and having higher gear ratios (S8, S38), said control unit having been programmed to interpret how bad the first vehicle take off attempt was, with said selection being dependent on how bad the first vehicle take off was.

5.2 As claim 1 of the third auxiliary request also contains the expression objected to in the context of the first auxiliary request, the above observations apply equally (see above point 3.).

5.3 Consequently, amended claim 1 of the third auxiliary request also fails to meet the requirements of Article 84 EPC. Therefore, the third auxiliary request is not allowable either.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairwoman:

C. Moser P. Acton

Decision electronically authenticated