

BESCHWERDEKAMMERN
DES EUROPÄISCHEN
PATENTAMTS

BOARDS OF APPEAL OF
THE EUROPEAN PATENT
OFFICE

CHAMBRES DE RECOURS
DE L'OFFICE EUROPEEN
DES BREVETS

Internal distribution code:

- (A) [] Publication in OJ
(B) [] To Chairmen and Members
(C) [X] To Chairmen

D E C I S I O N
of 8 May 1996

Case Number: T 0775/94 - 3.5.2

Application Number: 85111437.1

Publication Number: 0174639

IPC: B60L 3/00

Language of the proceedings: EN

Title of invention:
Electric railway car control device

Patentee:
MITSUBISHI DENKI KABUSHIKI KAISHA

Opponent:
Asea Brown Boveri AG, Baden, Schweiz.

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty and inventive step - yes"

Decisions cited:
-

Catchword:



Case Number: T 0775/94 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 8 May 1996

Appellant:
(Opponent)

Asea Brown Boveri AG, Baden
c/o ABB Management AG
Abt. TEI-Immaterialgüterrecht
Wiesenstr. 26
CH-5401 Baden (CH)

Representative:

-

Respondent:
(Proprietor of the patent)

MITSUBISHI DENKI KABUSHIKI KAISHA
2-3, Marunouchi 2-chome
Chiyoda-ku
Tokyo 100 (JP)

Representative:

Lehn, Werner, Dipl.-Ing.
Hoffmann, Eitle & Partner
Patentanwälte
Postfach 81 04 20
81904 München (DE)

Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 5 July 1994
rejecting the opposition filed against European
patent No. 0 174 639 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: W. J. L. Wheeler
Members: A. G. Hagenbucher
B. J. Schachenmann

Summary of Facts and Submissions

I. The appellant filed an opposition against European patent No. 0 174 639 and now contests the decision of the Opposition Division rejecting the opposition.

II. Claims 1, 5 and 6 of the patent as granted read as follows:

"1. An electric railway car control device, comprising:
a master controller (1), for providing operating instructions;
running direction detecting means (2, 3) for detecting a running direction of a railway car and producing an output signal representing the running direction;
an inverter (5) for driving an AC main electric motor (6); and
control mode selecting means (4) for comparing an instructed direction defined by an operating instruction provided by said master controller (1) with the running direction defined by said output signal, characterized in that:
said selecting means (4) is arranged to apply a braking control instruction to said inverter (5) in accordance with the running direction of said output signal to thus control said AC main electric motor (6) for braking when said instructed direction differs from the running direction."

"5. A drive arrangement for a railway car comprising an A.C. electric motor (6) and a control device according to any one of the preceding claims."

"6. A railway car comprising a drive arrangement according to claim 5."

III. In the notice of opposition the appellant requested revocation of the patent on the ground that its subject-matter was not patentable within the terms of Articles 52 to 57 EPC, but presented arguments only in relation to the ground of lack of inventive step based on the following documents:

D1: Schweizerische Bauzeitung, 95th Jahrgang, Heft 15, 14 April 1977, pages 217-225,

D2: Elektrische Bahnen, Heft 5, 43rd Jahrgang, 1972, pages 106-116.

Exercising its discretion under Article 114(2) EPC, the Opposition Division disregarded D3: Brown Boveri Mitteilungen, vol. 52, No. 9/10, 1965, pages 706-719 cited by the appellant with his letter of 11 May 1994 (hence, outside the time limit set in Article 99(1) EPC) because it did not consider it relevant.

IV. In the grounds of appeal the appellant argued without reference to any prior art documents that the claimed subject-matter resulted just from the automation of a process which had previously been carried out by hand, as was generally known. The final sentence contained a brief reference to the arguments in the opposition proceedings

V. In an annex to the summons to oral proceedings, the Board observed that the closest prior art appeared to be D4: JP-A-59/28801 which was mentioned as prior art in the patent in suit. An English translation D4' of D4 was enclosed with the annex, which contained a preliminary analysis of the content of D4' in relation to the claimed subject-matter of the patent in suit.

VI. During the oral proceedings on 8 May 1996 the appellant argued that the subject-matter of the claims of the patent in suit was not new in view of D4 (D4'). The inverter mentioned in D4 (D4') normally operated actively (under power running) or passively (braking under power regeneration) and in response to forward or reverse movement commands. When the instructed movement direction differed from the actual running direction, the inverter was stopped. This meant that the inverter thyristors were stopped, leaving only the inverter diodes operating in the power regeneration mode. This amounted to a control of the AC main electric motor for braking in accordance with the running direction. Consequently, the subject-matter of claim 1 was not new, as had already been stated by the first examiner during the pre-grant examining proceedings.

VII. The respondent argued that during the oral proceedings the appellant had presented for the first time a completely new argumentation which would require a continuation of the proceedings in writing in order to give the respondent a fair chance for further reflection if the Board found the appellant's new reasoning convincing. Moreover, D4 (D4') disclosed only that the inverter (2) was stopped when the comparator (8) detected that the direction of the motor rotation and the ordered direction of movement were different. Stopping the inverter meant rendering all inverter functions ineffective. D4 did not indicate that stopping the inverter meant just stopping the inverter thyristors. D4 did not indicate anything which could lead to the assumption that the inverter contributed after its stop to a controlled braking. When the inverter worked under normal conditions, i.e. when the actual running direction of the railway car and the movement control instruction coincided in their

directions, a motor control was effected, but nothing could be derived from D4 (D4') that this was still the case when the inverter was stopped.

VIII. The appellant requested that the decision under appeal be set aside and that the European patent No. 0 174 639 be revoked.

IX. The respondent requested that the appeal be dismissed (main request) or that the proceedings be continued in writing (auxiliary request).

Reasons for the Decision

1. The appeal is admissible.

2. The Board concurs with the opinion of the Opposition Division to disregard late filed document D3 under Article 114(2) EPC, because it is not relevant.

3. *Novelty*

3.1 Claim 1

3.1.1 As was set out in the annex to the summons to the oral proceedings, D4 (see also translation D4') discloses an electric rail vehicle control device, comprising:

(a) a master controller for providing operating instructions;

(b) running direction detecting means for detecting the running direction of the electrically driven rail vehicle and producing an output signal representing the running direction;

- (c) an inverter for driving an AC main electric motor;
- (d) control mode selecting means for comparing the instructed direction defined by the operating instruction provided by the master controller with the running direction defined by said output signal.

D4 describes two embodiments. According to the first embodiment the inverter is stopped by the selecting means in order to avoid an excessive current in the inverter when the instructed direction differs from the running direction. According to the second embodiment the process provided by the first embodiment starts only when the rotatory speed of the motor exceeds a set value.

D4 (D4') does not define what is meant by the statement that the inverter is stopped. The natural interpretation is that the inverter is set (e.g. by interrupting its connections with other units) into a state in which it does not perform any of its normal functions, namely power running, power regeneration, forward or reverse movement control. Braking could then be effected only mechanically without the aid of the inverter.

Appellant's interpretation that it means interrupting only the current through the usual inverter thyristors so that the usual inverter diodes keep their passive electrical power regeneration function (cf. D2, Chapter 3.2.2) thus effecting electrical braking, is mere speculation and provides as such no basis for a novelty objection all the more because D4 does not even mention inverter components such as thyristors or diodes.

3.1.2 Even if the appellant's interpretation could be accepted, the passive electrical power regeneration function would not amount to a control of the main electric motor for braking in which the inverter plays an active role (cf. EP-B-0 174 639, page 3, line 54 to page 4, line 3). In contrast to D4, according to the present patent the inverter is used in an active way in that an instructed movement direction opposite to the running direction is automatically transformed into a braking control instruction to the inverter in accordance with the running direction of the railway car, i.e. by transforming a forward driving or braking instruction during backward running into a backward braking instruction and a backward driving or braking instruction during forward running into a forward braking instruction (cf. Table 1), in order to make controlled use of the inverter for electrical braking without an excessive inverter load by using it beyond the stall torque points of the motor torque curves.

Neither of documents D1 and D2 discloses an electrical railway car control device with all the features in claim 1, either.

Hence, the subject-matter of claim 1 is novel with respect to the cited prior art.

3.2 Claims 5 and 6

In accordance with the respondent's declaration during the oral proceedings, the subject of the word "comprising" in claim 5 is the "drive arrangement", not the "railway car". This is the most sensible interpretation of the claim. Hence, claims 5 and 6 comprise the control device of claim 1 as a limiting feature. Therefore, the subject-matter of claims 5 and 6 is also novel.

4. *Inventive step*

4.1 Closest prior art and problem underlying the present invention.

In the Board's opinion, D4 represents the closest prior art. It discloses a railway car control device with the features (a) to (d) set out in paragraph 3.1 above. If in this known device the inverter was used in a normal way in a situation where a movement instruction (brake or drive) is of a direction different from the actual running direction of the car, the slip frequency could become excessively large and the system could go beyond the stall torque points of the motor torque curves. It would then not only become impossible to produce torque, but there would also be a risk of excessive current which could cause damage. For this reason, the operation of the inverter is stopped. It is assumed that the vehicle is then stopped by mechanical braking without the aid of the inverter.

In the Board's opinion, starting from D4, the problem to be solved by the present invention is to provide an electric railway car control device in which, when the direction of a movement instruction (brake or drive) is not in agreement with the actual running direction of the vehicle, control is carried out adequately in such a manner that effective electric braking is ensured at all times.

4.2 The solution defined in claim 1 to this problem, which allows the active use of the inverter for electrical braking, has been explained in paragraph 3.1.1 above.

4.3 The appellant did not put forward any arguments aimed at showing it would be obvious to a person skilled in the art to use the inverter mentioned in D4 actively for

braking in the specific situation where a movement instruction indicating also a direction differs in its direction from the running direction of the car. Even if the design of an inverter comprising diodes and thyristors is generally known (cf. D2, Chapter 3.2.2), D4 does not give any incentive to use the diodes of such an inverter in this situation for braking. Even then the inverter would be used only passively like a constant brake resistor but not actively allowing a controlled braking torque avoiding the stall torque points. On the contrary, the fact that according to D4 the inverter is stopped teaches away from its active use in this specific situation. In view of this definite statement in D4 a person skilled in the art would not derive any incentive from D1 or D2 or his general knowledge to use the inverter of D4 actively in the claimed manner. The appellant's further argument that the claimed solution merely follows from the automation of operations normally carried out by a car driver without any reference to documents and any specification of the railway car control device and its brake systems (electrical, mechanical) to be used by this driver, remains mere speculation. It is not open to an objective assessment.

4.4 It follows from the arguments set out in paragraph 4.3 that the subject-matter of claim 1 is not obvious to a person skilled in the art and is considered therefore as involving an inventive step.

4.5 The same applies to claim 5 and 6 (cf. also paragraph 3.2 above).

4.6 Hence, the Board upholds the conclusion reached by the opposition division that the subject-matter of claims 1, 5 and 6 is novel and involves an inventive step. Claims 2 to 4 being properly dependent on claim 1, are also allowable.

Order

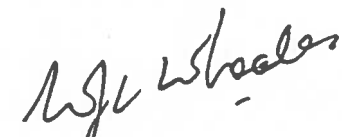
For these reasons it is decided that:

The appeal is dismissed.

The Register:


M. Kiehl

The Chairman:


W. J. L. Wheeler

