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 27 April 1995

Case Number: T 0204/94 - 3.2.1

Application Number: 88903790.9

Publication Number: 0409829

IPC: B60G 17/00, G01D 18/00

Language of the proceedings: EN

Title of invention:
Calibration of a height regulating device in a vehicle filled with air suspension

Patentee:
ROBERT BOSCH GMBH

Opponent:
WABCO Standard GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0204/94 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 27 April 1995

Appellant: (Opponent)
WABCO Standard GmbH
Euskirchener Str. 80
D-53121 Bonn (DE)

Respondent: (Proprietor of the patent)
ROBERT BOSCH GMBH
Postfach 30 02 20
D-70442 Stuttgart (DE)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office announced on 19 January 1994, with written reason posted on 2 February 1994 rejecting the opposition filed against European patent No. 0 409 829 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: F. A. Gumbel
Members: P. Alting van Geusau
B. J. Schachenmann

Summary of Facts and Submissions

I. European patent No. 0 409 829 was granted with effect from 15 January 1992 on the basis of the international application No. WO 89/09 702 (European patent application No. 88 903 790.9) filed on 14 April 1988.

The independent Claims of this patent read as follows:

"1. A method of calibrating a height sensor in an electronically controlled height regulating device of an air spring suspension system of a vehicle, characterised in that the height regulating function is disabled and the air springs are controlled externally to bring the body height to the desired null position whereafter the height sensor reading (h_n) for this null position is programmed into the regulating device to serve as a reference value or an initial reference value for the height regulation."

"7. Apparatus for calibrating a height sensor in a height regulating device of an air spring suspension system of a vehicle, the height regulating device having an electronic control device (44) which controls a valve arrangement (24) for supplying compressed air to and releasing air from air springs (16) in accordance with the difference between the height signal (h) from the height-sensor (20) and a reference height (h_o), characterised in that the electronic control device (44) is programmed to be switched out of its height regulating mode and into a test mode in which it can be controlled externally to raise or lower the vehicle body (10) to a predetermined height (h_n) which can be checked physically and in which it can store a signal

corresponding to said predetermined height (h_n), the stored signal (h_n) serving to provide the reference height (h_o) for comparison after the height regulating mode has been re-established."

II. The Appellant (Opponent) filed an opposition against the European patent on the grounds that the subject-matter of the patent lacked novelty and an inventive step having regard to the prior art disclosed in:

D1: "Werktstatthandbuch 8610", "Technische Einführung FA1100, FA1300, FA1700 und FA1900", DAF Trucks Service
Promotion Niederlande, October 86, frontpage, title page and pages 5-1-1, 5-1-2, 5-1-3, 5-1-4, 9-3-1, 9-3-2, 9-3-3, 9-3-4, 9-3-5,

D2: "Betriebsanleitung DAVIE", DAF Trucks Service Promotion Netherlands, Oktober 1986, frontpage, titlepage and pages 1 to 13,

D3: "Neutypen und Neuerungen Lastkraftwagen 1987, Einführungsschrift für den Kundendienst", Daimler-Benz AG, September 87, frontpage, titlepage and pages 3, 62 to 65,

D4: "Handbuch Meßtechnik und Qualitätssicherung" VEB Verlag Technik, Berlin; 1981, titlepage, bibli. data and pages 29 and 30,

D5: EP-A-0 297 736 (Article 54(3) EPC, not prepublished)

D6: DE-A-3 619 777

III. By decision announced at oral proceedings held on 19 January 1994, with written reasons posted on 2 February 1994, the opposition was rejected.

For the decision only the documents D1 to D4 were taken into consideration because the documents D5 and D6 had been cited by the Appellant without any detailed

explanation of their special relationship to the invention. The Opposition Division held that none of the prior art documents D1 to D4 concerned calibrating of any kind of sensors and consequently that an inventive activity was necessary to develop the invention from the prior art.

IV. The Appellant filed a notice of appeal against this decision on 4 March 1994 and paid the appeal fee on the same day. He requested that the impugned decision be set aside and that the patent be revoked in its entirety.

The Statement of Grounds of Appeal was filed on 11 March 1994.

V. Following auxiliary requests filed by both parties oral proceedings were held on 27 April 1995. The Respondent requested that the appeal be dismissed and auxiliarily, that the patent be maintained in amended form on the basis of Claims 1 to 10, filed at the oral proceedings.

VI. At the oral proceedings and in his written submissions the Appellant essentially relied upon the following arguments in support of his request:

The decision under appeal gives the impression that sensor calibration is something new and firstly put into practice by the present patent. Such an opinion cannot be upheld because even the introduction to the description of the patent acknowledges that sensor calibration belongs to the prior art. Sensor calibration is thus a matter the skilled person is well acquainted with.

It is true that D1 and D2 do not disclose a sensor calibration method. However in the present case the question should be posed what steps the skilled person would carry out for calibrating the sensors of the electronically controlled height regulating device of the air suspension systems known from D1 and D2 and if normal professional considerations would already lead in an obvious manner to the calibrating method claimed in Claim 1 of the patent under appeal, thus depriving this method and apparatus of any inventive activity.

In this respect D1 and D2, which both concern the same air spring suspension system and thus can be considered as one disclosure, already provide external control of the air springs by means of the diagnose-, programming and checking apparatus DAVIE (D2). It would therefore be apparent to the skilled person that no extra lifting device is necessary to bring the vehicle in any wanted null position. It is further plainly obvious that such lifting can only be carried out when the height regulating function is disabled.

For the calibration of the sensor in fact only two possibilities are available, i.e. the mechanical adjustment of the sensor with respect to its mounting and the electrical adjustment by programming the sensor output value at the null position of the vehicle into the memory of the regulating device.

The latter form of calibration is in principle analogous to the correction of a scale which went astray, for example on a tuning dial of a radio, by redefining the positions of the stations to be received, for example by gluing small strips of paper on the dial at the new positions where the radio stations are indeed received. Such correction method is well known to any person having had such experience of adjusting the radio tuning

dial indication and in view of the possibilities of electronic control does not pose any problem to be put into practice in the manner claimed in the present patent.

Calibration with mechanical adjustment of height sensors is already known from the prior art discussed in the patent and it cannot be considered inventive to select the only possible other manner of calibration. Moreover, the system disclosed in D1 and D2 is an electronic control system and it is explicitly acknowledged that the diagnose apparatus disclosed in D2 is also used for programming of the height regulating device. Therefore the known system already comprises all the necessary features for carrying out calibration by assigning a particular height sensor measuring value to a null position of the vehicle height and programming this value as the null position in the regulating device.

Consequently, in case the skilled person would need to calibrate the sensors of the system disclosed in D1 and D2 he would arrive in an obvious manner at the calibrating method defined in Claim 1 of the patent in suit.

VII. The Respondent (Proprietor) relied essentially upon the following submissions:

The system disclosed in D1 and D2 does neither relate to the calibration of the height sensors used in the system nor can it be considered to give a lead to the calibrating method defined in Claim 1 of the patent in suit. The diagnose- apparatus disclosed in D2 has only very limited programming possibilities which moreover have nothing to do with calibration of the sensors.

As regards the Appellant's example concerning the radio receiver station tuning dial it should be noted that marking new station positions on the dial by hand does not anticipate or give a hint to reassignment of all the station positions over the whole range of the dial by calibrating one new reference position in a memory.

It must further be considered that Claim 1 relates to a combination of measures for calibrating a height sensor that is not known from or hinted to in the prior art and that therefore even the obviousness of one or more single steps of the method is not a valid reason for concluding that the method of Claim 1 as a whole is deprived of an inventive activity.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC. It is admissible.

2. *Novelty*

Novelty of the subject-matter of the independent Claims 1 and 7 follows from the fact that none of the cited documents relates to calibration of a height sensor in an electronically controlled height regulating device of an air spring suspension system of a vehicle. The calibrating method of a height sensor as is acknowledged in the description of the patent (see column 1, lines 10 to 18) exclusively refers to mechanical adjustment of the sensor.

Novelty was, moreover, not disputed in the appeal proceedings.

3. *Inventive step*

3.1 In the absence of any document disclosing a method of or apparatus for calibrating a height sensor in an electronically controlled height regulating device of an air spring suspension system of a vehicle the starting point for the assessment of inventive step of the subject-matter of the independent Claims must be considered to be the conventional calibrating method as is discussed in the introduction of the description of the present patent (see column 1, lines 10 to 18).

In this method the vehicle body is brought to the required reference height by external lifting means and then the position of the height sensor is adjusted until it delivers the correct electrical value associated with that height.

3.2 Such a method has the drawback of additional expenditure for the lifting means and troublesome measuring and is, therefore, not suitable for mass production techniques.

It is therefore an object of the subject-matter of the invention as defined in the independent Claim 1 and 7 to further develop the conventional calibrating method and apparatus so as to avoid these drawbacks.

In accordance with the subject-matter of the independent Claims 1 and 7 this problem is solved essentially by

(a) disabling the height regulating function of the height regulating device,
(b) externally controlling the air springs to bring the body height to a desired null position and
(c) programming this null position into the regulating device to serve as a reference value for the height regulation.

3.3 Considering the known air spring suspension system disclosed in D1 and the diagnoses, programming and checking apparatus DAVIE for this system as is disclosed in D2, it is observed that "external" control of the air springs to bring the vehicle body in a wanted position can be carried out by means of the DAVIE apparatus (see page 11 of D2). When the checking apparatus DAVIE is operational obviously the height regulation is deactivated. In so far the Appellant's interpretation of the system disclosed in D1/D2 can be followed.

3.4 The DAVIE apparatus has a checking mode for checking proper functioning of the air valves (see end of page 8 of D2). In this particular mode the air valves are actuated manually and it can be derived from the checking results whether the sensors are correctly mounted. However, in case it is concluded that the sensor is not correctly mounted, reference is made to the service manual of the vehicle which reference, in the Board's opinion, indicates that calibration of the sensor, if such calibration is in fact needed, is carried out by a mechanical adjustment of the sensor.

3.5 The Appellant considered that it would be obvious to the skilled person to envisage, instead of a mechanical adjustment of the sensor, a calibration by reassigning the sensor output reading to a wanted null position by reprogramming the height regulating device accordingly since this would be the only other calibration alternative available and, moreover, the system disclosed in D1 and D2 would readily be suitable for such calibration.

In support of this assertion the Appellant did, however, not file any documents as evidence but merely referred to the general technical knowledge of a skilled person, inter alia to the possibilities for correction of a

radio station tuning dial on a receiver that went astray, i.e. either by correction of the tuning condenser drive itself or by reassignment of the indicated positions on the dial, for example by gluing markings on the dial at the positions at which the radio stations are indeed received. Such correction methods were considered to be generally known to the skilled person and it would therefore be obvious to such person to apply them were necessary.

3.6 However, the Board cannot accept this point of view. There is no disclosure derivable from either D1 or D2 that the system disclosed therein would immediately be suitable for a method of calibration in accordance with Claim 1 of the patent in suit.

Although D1 and D2 disclose that the DAVIE apparatus can be used for reprogramming (see in particular page 7, lines 3 and 4 of D2) of the height regulating device (ECAS), in so far as programming is concerned only a change to a another, apparently pre-stored, table in the ECAS control unit is provided. Such a change of the ECAS control program does not imply a calibrating possibility by which an initial value of a desired null position is erased from and a new height sensor reading is programmed into the memory of the regulating device as a new desired height value but rather refers to the possibility to select the proper pre-stored table belonging to the vehicle concerned (see in particular the first three text lines on page 11).

Furthermore, the example concerning the radio tuning dial referred to by the Appellant is not considered relevant when comparing it with the calibrating method carried out in the present case. Providing new markings on a tuning dial which correspond with positions at which the wanted stations are received is in fact the

provision of a new dial or, in accordance with the Appellant's opinion, a new "table", but is not equivalent to a calibrating method in which one particular value is reassigned with the effect that the initial reference position is shifted to a new reference position for the whole range of height sensor readings.

3.7 No other examples for support of the alleged obviousness of a method of calibrating an air spring suspension regulating system by reassigning a particular height sensor reading stored into a memory of the regulating system to a desired null position were submitted by the Appellant.

The Appellant did also not provide any proof or other submissions from which it could be concluded that a comparable calibrating method was readily available to the skilled person at the priority date of the present patent.

Considering that it is the Opponent's responsibility to provide the evidence in support of his contentions, the lack of any evidence or convincing reasons for support of the asserted ground of opposition in particular in respect of the third characterising feature of Claims 1 and 5 leads the Board to the conclusion that the Appellant's allegation is not sufficiently substantiated and cannot be accepted as a valid ground for deciding the obviousness of the subject-matter of the independent Claims 1 and 7.

Moreover, it is to be noted that the system disclosed in D1 and D2 does neither address nor give a solution to the problem underlying the present patent. Therefore the skilled person did not have any reason to adopt isolated single features of this known system for the development of the system claimed.

3.8 There is no need to give a detailed discussion of the other documents relied upon by the Appellant in the opposition proceedings but not further taken up in the appeal proceedings. Clearly these documents do not come nearer to the claimed subject-matter than the system disclosed in D1 and D2.

4. Summarising, in the Board's judgment, the proposed solutions to the technical problem underlying the patent in suit defined in the independent Claims 1 and 7 involve an inventive and therefore these Claims as well as their dependent Claims relating to particular embodiments of the invention in accordance with Rule 29(3) EPC, are acceptable (Article 52(1) EPC) in their granted form.

5. Since the Respondent's main request is allowable there is no need to consider his auxiliary request.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

S. Fabiani

The Chairman:

F. Gumbel