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Datasheet for the decision of 24 April 2013

Case Number: T 0685/11 - 3.2.01

Application Number: 00983656.0

Publication Number: 1246745

IPC: B60T 13/58, B60T 11/24

Language of the proceedings: EN

Title of invention:
Device to control a brake arrangement and a brake system for a heavy vehicle with such a brake arrangement

Patent Proprietor:
Scania CV AB (publ)

Opponent:
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 123(2), 54(2), 56
RPBA Art. 13(1)

Keyword:
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
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Case Number: T 0685/11 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 24 April 2013

Appellant: (Patent Proprietor)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted on 24 January 2011 revoking European patent No. 1246745 pursuant to Article 101(3)(b) EPC.

Composition of the Board:

Chairman: G. Pricolo
Members: H. Geuss
P. Guntz

Summary of Facts and Submissions

I. The appeal of the patent proprietor is directed against the decision of the opposition division, posted on 24 January 2011, concerning the revocation of European patent No. 1 246 745.

II. The opposition division held that the subject-matter of claim 1 as granted was not new with respect to the prior art disclosed by document

DE 196 04 391 A1 (**D2**),

or, under the assumption that novelty over D2 was given, that the subject-matter of claim 1 was not inventive over D2.

III. Oral proceedings before the board were held on 24 April 2013.

During the oral proceedings, the appellant (patent proprietor) withdrew all former requests, including the objection that the opposition division committed a procedural violation.

Further, the appellant submitted a new, sole request and requested that the decision under appeal be set aside and that the patent be maintained in amended from according to the sole request, filed during the oral proceedings.

The respondent (opponent) requested that the appeal be dismissed.

IV. Claim 1 reads as follows:

Arrangement for controlling a braking arrangement on a heavy vehicle, such as a truck for example, with a number of wheels that bear the vehicle, which braking arrangement comprises a main brake that includes braking devices (1a-f) that are each arranged to act on one of the named wheels (2a-f), at least one auxiliary brake (3) and at least one brake control (10) with which the named main brake (1a-f) and the named auxiliary brake (3) are activated,
and wherein the arrangement includes a control unit (9), wherein when the brake control (10) is activated, the control unit (9) is arranged to initiate activation of the named main brake (1a-f) and the named auxiliary brake (3) and thus distribute the braking effect between the named main brake (1a-f) and the named auxiliary brake (3),
wherein the control unit during an initial period of the named activation is arranged to distribute essentially the whole of the braking effect to the named braking devices (1a-f) of the main brake,
wherein said control unit (9) is arranged in such a way that utilisation of the braking devices (1a-f) of the named main brake is minimised after the initial period, and after the initial period the control unit (9) is arranged in such a way that the braking effect is distributed to the auxiliary brake (3), wherein the control unit (9) is arranged in such a way that the sum of the braking effect from the named main brake (1a-f) and the braking effect from the named auxiliary brake (3) essentially corresponds to a reference value,
wherein a sensor (12) used to sense the vehicle's retardation characterized in that

the retardation is arranged to be fed back to the named control unit (9), wherein the control unit (9) is arranged to compare the vehicle's retardation to the named reference value.

V. The appellant's submissions may be summarized as follows:

The sole request filed during the oral proceedings should be allowed into the proceedings. This request is based on the third auxiliary request, filed on 29 February 2012, i.e. more than one year in advance of the date of the oral proceedings before the board of appeal. Consequently, the respondent had had enough time to consider the request and possibly formulate objections. Since the requests filed on 29 February 2012 had not been commented by the respondent, it could have been assumed that the respondent had no objection as regards their admissibility.

The amendment of claim 1, consisting in specifying that after the initial period the control unit is arranged in such a way that the braking effect is distributed to the auxiliary brake, clarifies, as compared to claim 1 as granted, the claimed subject-matter. This feature is taken from the description, where it is disclosed on page 3, lines 24 to 33 and on page 4, lines 5 to 13, and fig. 3 (cf. WO-publication). Furthermore, claim 1 is amended to include the features of granted claims 2 and 5. Consequently amended claim 1 fulfils the requirements of Article 123(2) EPC 1973.

The subject-matter of claim 1 differs from the arrangement according to document D2 by the features that the value "retardation" is arranged to be fed back

to the control unit, the control unit being arranged to compare the vehicle's retardation to the reference value. These distinguishing features provide a closed-loop feedback control system with a control over the whole braking system, including the main brakes. This aspect is not disclosed in D2. The passage in D2, column 3, lines 14 to 50 merely refers to anti-lock braking (ABS) situations in which the braking effect should be maximized. The closed-loop feedback control system in a anti-lock braking situation is not equivalent to the closed-loop feedback control system according to the invention which distributes the braking effect to the main brakes and the auxiliary brake and provides overall feedback control in normal braking situations. Therefore, the subject-matter of claim 1 is new over document D2.

Said distinguishing features contribute to the solution of the problem stated in the patent in suit, that is to provide a fast braking response when the driver requests a braking effect and to reduce brake lining wear on the wheel brakes.

D2 is concerned with an arrangement comprising a main brake and a retarder as an auxiliary brake. According to the teaching of D2, the desired braking effect of the main brake is modified based on an offset value, which is determined based on the difference between the actual braking moment value of the retarder and the desired braking moment value of the retarder. A control in which the main brake takes part to a closed loop feedback system is not disclosed in D2.

For these reasons, the subject-matter of claim 1 is inventive.

VI. The respondent's reply can be summarized as follows:

The appellant's request is late filed and should not be admitted into the proceedings. Furthermore claim 1 of this request defines subject-matter which *prima facie* extends beyond the content of the application as originally filed.

The feature taken from the description that after the initial period the control unit (9) is arranged in such a way that the braking effect is distributed to the auxiliary brake is not originally disclosed. The corresponding passage in the original description states that, after the initial period, the control unit has the possibility of distributing the whole of the braking effect to the auxiliary brake and the main brakes become inactive. However, the added feature does not reflect that the main brakes are inactive; thus claim 1 contravenes the requirements of Article 123(2) EPC.

The subject-matter of claim 1 of the current request is not new. The feature "wherein the control unit (9) is arranged to compare the vehicle's retardation to the named reference value" is also disclosed in document D2. A set-actual comparison with a reference value is a common technique in closed-loop feedback systems. In particular, document D2 discloses a control according to set values (cf. "Sollverzögerungswerte", column 3, line 27) and a comparison with actual values (cf. column 3, line 33, "Regelkreise"). The technical feature "Regelkreis" in German corresponds to the feature "closed-loop feedback system" in English.
Thus, the subject-matter of claim 1 is not new.

In any case, the subject-matter of claim 1 is not inventive starting from D2, since a closed-loop feedback control system would be within the scope of a skilled person. D2 discloses a closed-loop feedback control which controls the retarder and its braking effect, dependent on driving and device parameters. Since the total brake effect is given by the actuation of the pedal by the driver, the total braking effect is indirectly controlled by the closed-loop feedback control (cf. figure 5). Consequently, the skilled person would consider a modification of a closed-loop feedback system in which the overall braking effect is part of the control loop. Since such a control system is generally known in the art, this modification cannot contribute to inventive step.

Reasons for the Decision

1. The appeal is admissible.

2. Admissibility of the appellant's request

2.1 The respondent objected that the request filed by the appellant at the oral proceedings before the board was late filed, as it could have been filed with the grounds of appeal, and that the request was clearly not allowable since the subject-matter of claim 1 extended beyond the content of the application as originally filed.

2.2 The claims according to the request under consideration correspond in substance to the claims according to the third auxiliary request filed on 29 February 2012: only claim 1 has been amended by modifying its two-part form

(in particular by shifting the expression "characterized in that").

2.3 Therefore, although the present request was filed at a very late stage of the appeal proceedings, it could not take the respondent by surprise, as a corresponding request, namely the third auxiliary request filed on 29 February 2012, was filed well in advance of the oral proceedings.

Moreover, the board held that the limitation introduced in claim 1 did not shift the discussion in a different and unexpected direction as compared to the case made by the appellant in the statement of grounds of appeal. The appellant namely added to claim 1 the feature taken from the description, according to which after the initial period the control unit is arranged in such a way that the braking effect is distributed to the auxiliary brake, to make it clear that this feature, which was already discussed under the assumption that it was implicitly present in claim 1, was indeed part of the claimed subject-matter. Furthermore, claim 1 is amended to include the features of dependent claims 2 and 5 as granted, and these additional features likewise do not introduce new aspects in the discussion.

Moreover, the board could not recognize that the introduction of the feature taken from the description would clearly result in an infringement of Article 123(2) EPC as submitted by the respondent. In fact, it appeared that the introduction of this feature only served the purpose of removing any possible doubts in respect of the presence of this feature in the subject-matter of claim 1 as granted.

2.4 Under these circumstances the Board decided to exercise its discretion under Article 13(1) RPBA to admit the appellant's request, filed during the oral proceedings.

3. Claim 1 of the sole request fulfils the requirements of Article 123(2) EPC.

3.1 The respondent objects the feature, that after the initial period the control unit is arranged in such a way that the braking effect is distributed to the auxiliary brake, on the grounds that it has been extracted from the description, see the passage on page 3, lines 24 et seq., where it is disclosed in combination with the feature that the main brakes are inactive and the whole braking effect is distributed to the auxiliary brakes.

3.2 The board does not accept the respondent's argument that this would lead to an unallowable extension in the sense of Article 123(2) EPC. The passage of the description relied upon by the respondent discloses "the possibility of distributing the whole of the braking effect to the mentioned auxiliary brake" with the consequence that the "main brakes are thus inactive". The reference to a "possibility" makes it clear that the feature that the main brakes are inactive and the whole braking effect is distributed to the auxiliary brakes is optional. Whether the control unit is able to take advantage of this *possibility* depends on further aspects, as the driving conditions or device parameters of the auxiliary brake.

In any case, before arriving at the conditions for taking advantage of this possibility, there will always be a phase in which the total braking effect is distributed between the main brake and the auxiliary

brake in a manner that the load of the main brake is minimized, cf. page 3, lines 5 et seq. and page 7, lines 14 et seq. Indeed, when the brake control is activated, it is the main brake that generates the main braking effect and then, with increasing braking effect of the auxiliary brake, the main brake is minimised.

4. The subject-matter of claim 1 is new in the sense of Article 54(1) EPC.

4.1 The features of the preamble are undisputedly disclosed by document D2.

4.2 The respondent argued that D2 also discloses the features of the characterizing portion of claim 1, namely that the retardation is fed back to the named control unit (9), wherein the control unit (9) is arranged to compare the vehicle's retardation to the named reference value. The passage in column 3, lines 14 et seq. of D2 explains that set values for retardation ("Sollverzögerungswerte") are compared with actual values in a closed-loop feedback control ("Regelkreise").

4.3 The board holds that this passage of D2 refers to a specific driving condition in which anti-lock braking is activated. According to D2 the tendency of any one of the individual wheels to lock is recognized on the basis of its speed behaviour; the braking force exerted on this wheel brake is reduced accordingly (cf. column 3, lines 34 to 37). This closed-loop feedback control, however, is different to the situation according to the contested invention in which the retardation of the (whole) vehicle is fed back to the control unit.

Furthermore, D2 discloses that the status information on the intervention by the ABS controller is fed back to the control unit (cf. column 3, lines 37 to 39). However

this feedback is not based on a value representing the vehicle's retardation. In fact, D2 is completely silent on the *vehicle's retardation* which is the controlled variable in the contested invention.

Thus, the features of the characterizing portion of claim 1 are not disclosed by document D2.

5. The problem underlying the patent in suit is to provide a fast braking response when the driver requests a braking effect and to reduce brake lining wear on the wheel brakes, cf. description, paragraph [0009] of the granted patent.

6. The features of the characterizing part contribute to the solution of this problem in that by feeding back the retardation to the control unit and comparing it to a reference value the distribution of the braking effect between the main brake and the auxiliary brake (which distribution is primarily responsible for a fast braking response and a reduced brake lining wear, see in particular par. [0013] of the patent in suit) is based on the actual braking condition of the (whole) vehicle. These features are not rendered obvious by the cited prior art.

6.1 The board does not agree with the respondent's argument that a skilled person would consider a closed-loop feedback control, comprising a control variable which relates to the vehicle's retardation, as an obvious alternative to the closed-loop feedback control as disclosed in D2.

D2 is concerned with a feedback control in which the braking effect of the auxiliary brake ("Dauerbremse",

and in particular "Retarder" in claim 1 of D2) is fed back to the control unit. After activation of the brake system the control unit adapts the braking effect of the main brake by taking into consideration the braking effect of the retarder. The basic control strategy of the arrangement according to the invention as defined in claim 1 is, however, based on a different concept than that of D2. Whereas the brake control according to D2 controls the brake effect of the main brake **depending on the effect of the auxiliary brake** such that a desired vehicle's braking effect is achieved as a result, the arrangement for controlling a braking arrangement according to the invention distributes the braking effect to the auxiliary brake and to the main brake **depending on the sensed vehicle's retardation** such that a desired vehicle's braking effect, which is the sum of the braking effect of the main and the auxiliary brake, is obtained. Thus, according to the invention, the combined, overall braking effect of the main brake and of the auxiliary brake is considered in the feedback loop whilst in D2 only the effect of the auxiliary brake is considered.

There is no indication in document D2 which would prompt the skilled person to consider the integration of the effect of the main brake into the feedback-control loop which is, in D2, based on the effect of the auxiliary brake.

The respondent referred to the fact that providing a closed-loop feedback control system is within the scope of a skilled person. It cannot be denied that, generally, a closed-loop feedback is matter of common general knowledge; this, however, cannot be taken to imply that

any specific application of the closed-loop feedback principle, such as the specific application according to claim 1, would be obvious for a skilled person.

6.2 Consequently, the subject-matter of claim 1 is inventive in view of document D2, even having regard to the common general knowledge of a skilled person.

7. The dependent claims 2 to 7 correspond to granted dependent claims 3, 4, 6 to 9 and the description has been adapted to be consistent with the amended set of claims.

Therefore, independent claim 1 together with the dependent claims 2 to 7 and the description as filed during oral proceedings of 24 April 2013, and the drawings of the patent as granted, form a suitable basis for maintenance of the patent in amended form.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of the following documents:

   - Claims 1 to 7,
     as filed during the oral proceedings;

   - description, columns 1 to 7,
     as filed during the oral proceedings;

   - figures 1 to 3 of the patent as granted.

The Registrar: The Chairman:

E. Goergmaier G. Pricolo