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D E C I S I O N
of 20 June 2001

Case Number: T 1109/98 - 3.5.1

Application Number: 90307795.6

Publication Number: 0411786

IPC: B60R 11/02, H04S 5/02

Language of the proceedings: EN

Title of invention:
Vehicular sound reproducing

Patentee:
Bose Corporation

Opponent:
Interessengemeinschaft für Rundfunkschutzrechte E.V.

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty (yes)"
"Inventive step (no)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1109/98 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 20 June 2001

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 1 October 1998 revoking European patent No. 0 411 786 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: S. V. Steinbrener
Members: R. S. Wibergh
P. H. Mühlens

Summary of Facts and Submissions

I. This is an appeal by the proprietor of European Patent No. 0 411 786 against the decision of the Opposition Division to revoke the patent.

II. Claim 1 of the patent as granted reads as follows (omitting the reference signs):

A vehicle with sound reproducing apparatus comprising:

a vehicle body including a floor, and front and rear, left and right side panels and windows above the side panels to partially define a passenger enclosure;

front seats and rear seats having seating surfaces in the passenger enclosure; and

four upper frequency driver units that radiate in at least the upper frequency range and are located in lower portions of respective the front and rear, left and right side panels; wherein the front upper frequency driver units are located forward of and below front passenger seat seating surfaces and the rear upper frequency driver units are located forward of and below the rear passenger seat seating surfaces; characterised by:

a non-localisable woofer module acoustically coupled to the passenger enclosure that provides to the passenger enclosure low frequency spectral components of frequencies lower than those provided by the upper frequency driver units.

III. The respondent had opposed the patent on the grounds that the invention was not new or did not involve an inventive step having regard to - among others - the documents

D1: US-A-4 648 117

D2: EP-A-0 284 286.

Later in the proceedings before the Opposition Division the patent proprietor (appellant) filed a declaration by Dr Bose, who is Chairman of the Board and Technical Director of the appellant company. In reply, the respondent filed the additional document

D6: DE-A-30 28 610.

IV. The Opposition Division decided that the subject-matter of claim 1 was new but not inventive over D1 taken in combination with D6.

V. The patent proprietor lodged an appeal against this decision. In the statement setting out the grounds of appeal it was stated that due weight had not been given to Dr Bose's affidavit. It was further argued that neither D1 nor D6 disclosed a non-localisable woofer.

VI. In a communication pursuant to Article 11(2) of the Rules of Procedure of the Boards of Appeal, the Rapporteur expressed the preliminary opinion that the invention might not even be new in view of D1.

VII. Oral proceedings before the Board were held on 20 June 2001. The appellant maintained the view that the invention as defined in claim 1 was both new and

inventive with respect to D1 and D6. The respondent argued that D1 destroyed the novelty of the invention, or at least rendered it obvious either alone or in combination with D6. At the end of the oral proceedings, the order of the Board's decision was announced orally by the Chairman.

VIII. The appellant requested that the decision under appeal be set aside and that the patent be maintained as granted.

IX. The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. *The invention*

The invention according to claim 1 is a vehicle equipped with a (high fidelity) sound reproducing system. This system comprises four driver units (loudspeakers) for the upper frequencies located in the right and left side panels and is characterised by a "non-localisable" woofer module. A non-localisable woofer module is, according to the description (see column 2, lines 1 to 13 of the patent-in-suit), defined by a far-field pressure frequency response which is "at least three (3) decibels (dB) down at a high break frequency of at most 300 Hz from the generally uniform response in a frequency range below the break frequency and has a substantial response at least as low as 80 Hz while the response progressively decreases above the higher break frequency". A high break frequency of 200 Hz is said to be even better, and 150 Hz is preferred.

2. *The prior art*

2.1 D1 is regarded as the closest prior art document. The appellant does not deny that this document discloses all the features contained in the preamble of claim 1. D1 furthermore describes an embodiment (referred to at column 11, lines 53 to 68 in connection with Figure 28) which includes an additional low-frequency sound speaker, ie a woofer, acoustically coupled to the passenger enclosure. It is not stated whether the woofer is non-localisable or not.

2.2 D6 discloses a conventional car stereo with two or four loudspeakers radiating at least in the upper frequency range and a woofer module, which may be added to such a conventional car stereo. The woofer should not be localisable ("... soll dieser eine Basslautsprecher als Schallquelle nicht ortbar sein... ", page 5).

3. *Novelty*

3.1 It has been debated whether D1 discloses a "non-localisable" woofer in the meaning of the patent, ie whether the woofer is such that

(a) the far-field pressure frequency curve has a high break frequency at which response is at least 3 dB down from the generally uniform response in a frequency range below the break frequency,

(b) said high break frequency is at most 300 Hz, and

(c) there is a substantial response at least as low as 80 Hz while the response progressively decreases above the high break frequency.

3.2 In Figure 28 of D1 three curves are shown, labelled A, B and C. These curves represent the frequency characteristic of the power amplifiers for the rear loudspeakers, the front loudspeakers, and the woofer, respectively. Woofer curve C has a cut-off point at an unspecified frequency (Figure 28 indicates no values for either the frequency or the gain). The Board finds that a skilled man would interpret this cut-off point as the frequency at which the signal has declined (at least) 3 dB, in accordance with convention. Furthermore, a comparison with Figure 27 indicates that the woofer is intended to have a substantial response at 80 Hz. According to Figure 27 a good response at 80 Hz is obtained for a system without a woofer. The embodiment with a woofer could not possibly be expected to have a weaker response.

3.3 The appellant has pointed out that Figure 28 of D1 refers to the frequency response of the amplifier and not of the loudspeaker, ie it does not show the "far-field pressure frequency response". However, it appears to the Board that in the absence of evidence to the contrary the skilled man would assume that the amplifier curve should in principle also describe the pressure response. After all, D1 is concerned with the practical problem of achieving good sound reproduction in a car. There seems to be little point in presenting frequency curves which would in fact not reflect the actual sound as perceived by the passengers.

3.4 A further observation by the appellant is that since curve C crosses the other two curves, the response of the upper frequency loudspeakers extends into the frequency region of the woofer so that the low frequency spectral components of frequencies of the

woofer are not lower than those provided by the upper frequency driver units, in contradiction to claim 1. However, the roll-off shown in Figure 28 is inevitable for any amplifier and will no doubt apply also to the upper frequency drivers of the invention. Moreover, it is explicitly stated in the description of the patent-in-suit (col. 2, second paragraph) that the upper frequency drivers in fact radiate energy having audible spectral components in a frequency range above a frequency just below the break frequency of the woofer, ie the frequency responses of the woofer and the upper range loudspeaker overlap.

3.5 This leaves the question whether it is unambiguously disclosed in D1 that the cut-off point in Figure 28 is at "at most 300 Hz". In this respect it is noted that Figure 25 shows the frequency response of the rear loudspeakers in a system without woofer, a curve which in principle corresponds to curve A in Figure 28. The shapes of the two curves are similar, with typical lower cut-off points. In Figure 25 this cut-off point is at 200 Hz whereas no value is given in Figure 28. Since the cut-off frequency for the woofer amplifier is shown in Figure 28 as being lower than the cut-off point for curve A it appears, on comparing Figures 28 and 25, that it must be lower than 200 Hz.

On the other hand, it could conceivably be argued that the sound from the rear loudspeakers in a system with a woofer would be somewhat differently perceived than in a system without a woofer, so that curve A of Figure 28 would not necessarily have exactly the characteristics shown in Figure 25. For this reason, the Board is prepared to accept that D1 does not *unambiguously* disclose a cut-off point of at most 300 Hz for the

frequency response of the woofer module.

3.6 Thus, the subject-matter of claim 1 is regarded as new.

4. *Inventive step*

4.1 Since no value is given for the cut-off point in Figure 28 of D1 (cf point 3.2 above), the technical problem solved with respect to the closest prior art may be seen in specifying the frequency response of the woofer known from D1, and in particular determining a suitable value for the cut-off point. By comparing Figures 28 and 25, as explained above, the skilled person would be led to consider a value below 200 Hz as suitable, or at least as being a proper starting point for a search for the optimal value. Hence, he would arrive at a non-localisable woofer module without exercising inventive skill.

4.2 In addition, since D1 describes the woofer only briefly, the skilled man would also consider searching the literature for a suitable woofer, especially a woofer which may be added to an existing car stereo system. He would find D6, which not only mentions that such a woofer should be non-localizable but also indicates some of its characteristics, such as a cut-off point of about 300 Hz ("etwa 300 Hz", page 7). Therefore, the skilled man would consider this value for the woofer in D1.

4.3 It follows that the claimed invention was obvious for the skilled person both in view of D1 alone, and in view of D1 combined with D6.

4.4 The Board has studied the declaration by Dr Bose but

found that it cannot invalidate the above reasoning. The declaration mainly concerns the question whether it was obvious to arrive at the subject-matter of the claim starting from a car audio system consisting of four full-range drivers and taking into consideration that systems including a non-localisable woofer were known as such from D2. D2 does not concern sound reproduction in vehicles, and the essential argument is that the D2 system would not necessarily have been regarded as suitable for use in a car. It should however be clear from the discussion above that this argument is of limited relevance when D1, which already discloses a car stereo system including a woofer, is taken as a starting point. Moreover, the declaration by Dr Bose does not take account of document D6.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl S. V. Steinbrener