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**Datasheet for the decision
of 26 September 2006**

Case Number: T 1449/05 - 3.4.03

Application Number: 01000595.7

Publication Number: 1211915

IPC: H05B 31/00

Language of the proceedings: EN

Title of invention:

Arrangement in connection with discharge lamp

Patentee:

Teknoware Oy

Opponent:

Oy Convince Electronics Ltd.

Headword:

-

Relevant legal provisions:

EPC Art. 56

RPBA Art. 10a, 10b

Keyword:

"Main request: inventive step (no)"

"First and second auxiliary requests: not admitted"

Decisions cited:

G 0001/88, T 0087/01

Catchword:

Discretion to permit amendment of a party's case pursuant to Article 10b(1) or (3) RPBA may be exercised against a proprietor who seeks to resile at a late stage in the opposition appeal procedure from a previous long-standing acknowledgement or persistent tacit admission of prior art.



Case Number: T 1449/05 - 3.4.03

D E C I S I O N
of the Technical Board of Appeal 3.4.03
of 26 September 2006

Appellant: Oy Convince Electronics Ltd.
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
19 September 2005 concerning maintenance of
European patent No. 1211915 in amended form.

Composition of the Board:

Chairman: R.G. O'Connell
Members: V. L. P. Frank
T. Bokor

Summary of Facts and Submissions

- I. This is an appeal by the opponent against the interlocutory decision to maintain European patent 1 211 915 in amended form (Article 102(3) EPC).
- II. At the start of the oral proceedings before the board the respondent proprietor submitted an amended main request and new first and second auxiliary requests.

Claim 1 of the main request is worded as follows (emphasis and erasures added by the board to indicate the amendments with respect to claim 1 in the version maintained by the opposition division):

- "1. An arrangement in connection with a fluorescent lamp, the arrangement comprising an electronic ballast for igniting and burning the fluorescent lamp (4), and a voltage control device located separate to the ballast and arranged to modify supply voltage of the ballast and to include a power control signal in the supply voltage transmitted to the ballast over current feed wires, wherein the voltage control device is a pulse modulator, which is arranged to generate a pulsed DC-signal and thus modify the base-frequency pulse shape of the **DC** supply voltage of the ballast to include power control information in the supply voltage, and that the arrangement further comprises, located in connection with the fluorescent tube and separate to the voltage control device
- a power filter (2) and

a control filter (1) for separating the power control signal (p) from the pulsed supply voltage (U_{in}), the ballast being responsive to the separated power control signal (p) in order to control the level of light of the fluorescent tube (4)."

Claim 1 of the first auxiliary request has the following wording:

"1. An arrangement in connection with a fluorescent lamp, the arrangement comprising an electronic ballast for igniting and burning the fluorescent lamp (4), and a voltage control device located separate to the ballast and arranged to modify supply voltage of the ballast and to include a power control signal in the supply voltage transmitted to the ballast over current feed wires, wherein the voltage control device is a **PWM** pulse modulator, which is arranged to generate a ~~pulsed DC signal~~ **DC supply voltage of the ballast by switching the DC supply voltage** and ~~thus~~ modify the base-frequency pulse ~~shape~~ **ratio** of the **DC** supply voltage of the ballast to include power control information in the **DC** supply voltage, and that the arrangement further comprises, located in connection with the fluorescent tube and separate to the voltage control device

a power filter (2) and

a control filter (1) for separating the power control signal (p) from the pulsed **DC** supply voltage (U_{in}), the ballast being responsive to the separated power control signal (p) in order to

control the level of light of the fluorescent tube (4)."

Claim 1 of the second auxiliary request has the following wording:

"1. An arrangement in connection with a fluorescent lamp, the arrangement comprising an electronic ballast for igniting and burning the fluorescent lamp (4), and a voltage control device located separate to the ballast and arranged to modify supply voltage of the ballast and to include a power control signal in the supply voltage transmitted to the ballast over current feed wires, wherein **the arrangement is for controlling the fluorescent lamp in a vehicle having a low voltage DC power supply, and wherein** the voltage control device is a **PWM** pulse modulator, which is arranged to generate a ~~pulsed DC signal~~ **DC supply voltage of the ballast from said low DC supply voltage of the vehicle by switching the supply voltage of the ballast** and ~~thus~~ modify the base-frequency pulse ~~shape~~ **ratio** of the **DC** supply voltage of the ballast to include power control information in the **DC** supply voltage, and that the arrangement further comprises, located in connection with the fluorescent tube and separate to the voltage control device

a power filter (2) and

a control filter (1) for separating the power control signal (p) from the pulsed **DC** supply voltage (U_{in}), the ballast being responsive to the separated power control signal (p) in order to

control the level of light of the fluorescent tube (4)."

Claims 2 to 5 are dependent on claim 1 and are the same for all the requests

III. The following prior art documents *inter alia* were cited in the opposition procedure:

D7: ST Microelectronics, Data Sheet of L9610C/L9611C, "PWM Power MOS Controller", October 2000

D11: US 5 872 429 A

IV. The appellant opponent argued *inter alia* as follows:

- The minor amendment to the main request filed at the start of the oral proceedings was not objected to, but the first and second auxiliary requests involved amendments on a scale which meant that they should be regarded as belated and not admitted into the proceedings.
- As already explained in the statement of grounds of opposition, a bus manufacturer (Volvo Bus Finland Oy, formerly Carrus) had a PWM controlled DC supply for incandescent lamps in a bus. Volvo wanted to replace the incandescent lamps by fluorescent lamps, and ordered ballasts from the proprietor and from the opponent on condition that the existing PWM voltage control device with two-wire feed could still be used. The appellant opponent received the order in May 2000 during a private meeting with Volvo. The appellant opponent built their ballast by combining

a dimmable ballast with a control filter. The control filter was needed to extract the PWM control signal from the input voltage to the ballast and to change it into proper form for the "0.5 to 5 VDC" dimming control signal of the ballast. The appellant opponent thus built - from commercially available blocks - a ballast which corresponded to D11 and could be fed via Volvo's PWM control device which, in turn, corresponded to D7. The arrangement of claim 1 of the main request corresponded to the direct combination of two prior art devices, namely the voltage control device of D7 and the ballast of D11. There were no difficulties in combining these devices, since the pre-conditioner of D11 made the ballast look resistive and the controller of D7 was designed to drive resistive loads.

V. The respondent proprietor argued essentially as follows:

- The amended main request was submitted in response to the novelty objection raised by the appellant opponent in his last written submission. The first and second auxiliary request were submitted to distinguish more clearly the claimed arrangement from the prior art.
- Document D11, the closest prior art, disclosed dimming of fluorescent tubes with an AC power supply. This document suggested the use of a coded dimmer, which had the advantage that minimum changes were made to the sinusoidal voltage wave. There was however no equivalence of this method for DC applications. The person skilled in the art was therefore not told how to apply the teachings of D11

to a DC environment. Document D11 also disclosed that the use of phase clipping was disadvantageous, as it increased EMI and produced lamp flicker. The skilled person trying to implement the arrangement of this document with a DC power supply would have therefore converted DC into AC and employed the disclosed coded dimmer.

- The circuit disclosed in document D7 was specifically designed to drive halogen, ie incandescent, lamps and was not suitable for fluorescent lamps. The skilled person would therefore have discarded the circuit of D7 and would have sought an integrated circuit designed as a ballast for fluorescent lamps.
- There was thus no motivation for combining documents D7 and D11; major changes would be required to the circuitry of D11 to make it compatible with pulsed DC voltages.

In his written submissions prior to the oral proceedings before the board, the respondent proprietor did not contest the assertion by the appellant opponent of the use in Volvo buses of PWM-DC control of incandescent lamps.

- VI. The appellant opponent requested that the decision under appeal be set aside and that the patent be revoked.

The respondent proprietor requested that the decision under appeal be set aside and that the patent be maintained on the basis of:

- claims 1 to 5 filed as main request during oral proceedings, or
- claims 1 to 5 filed as first auxiliary request during oral proceedings, or
- claims 1 to 5 filed as second auxiliary request during oral proceedings.

Reasons for the Decision

1. The appeal is admissible.
2. *Main request - Inventive step - (Article 56 EPC)*
 - 2.1 The opposed patent relates to an arrangement for two wire dimming of fluorescent lamps using a DC-power supply. Since lamps are often located in places that are difficult to reach, such as the ceiling, the control device for dimming the lamp cannot be placed close to the lamp, but has to be located at the light switch. This means that in addition to the normal two current feed wires a third control wire is required for transmitting the dimming information to the lamp's ballast. The need for a third wire is onerous and does not allow for easy replacement of incandescent lamps by fluorescent ones in existing installations (paragraph [0004] of the opposed patent).
 - 2.2 The patent further discloses under the heading "Background of the invention" that when dimming incandescent lamps "Direct current arrangements employ

pulsed, i.e. pulse-width-modulated (PWM), direct current in order to keep the efficiency of the control device good. A mean value of the pulsed direct current is formed according to a pulse ratio, i.e. a 50% pulse ratio corresponds to about a 50% voltage value. When pulse frequency is sufficiently high (e.g. 50 Hz), the human eye perceives light as unflickering. This is due to the slowness of the eye and to the thermal mass of an incandescent filament, which makes the temperature of the incandescent filament slow to change. In control arrangements for incandescent lamps, the control may be located separately from the incandescent lamp; most typically, it is installed in connection with a light switch" (paragraph [0003] of the patent).

- 2.3 At oral proceedings before the board the respondent proprietor denied that the prior art cited in the said paragraph [0003] had been made available to the public before the priority date of the opposed patent. He referred to this prior art as being internal knowledge of the patent proprietor and maintained that, in fact, reference should have been made in this passage to an AC arrangement in which phase clipping control was employed for dimming the brightness of incandescent lamps and that in the conventional systems the voltage controller was not remote from the lamp.
- 2.4 The appellant opponent, however, stated repeatedly in the opposition procedure that the Volvo Bus Corporation, a big manufacturer of buses, had informed them that since 1999 it had used a two wire PWM controlled power supply for halogen lamps and had invited the appellant opponent to submit a design for an option to replace the halogen lamps by fluorescent lamps compatible with

that power supply (page 3 of the opponent's letter dated 27 April 2004, page 4 of the letter dated 13 December 2004, page 2 of the letter dated 12 May 2005). These allegations were not contested by the patent proprietor during the opposition procedure.

2.5 In the statement of grounds of appeal, the appellant opponent argued again that it had been common practice to use PWM control devices for dimmable halogen lamps in applications where a low voltage DC power supply was available, such as in buses. This prior art was explained in the patent specification at column 1, paragraph [0003] which was further supported by the disclosure of document D7. He further referred again to the order by the Volvo Bus Corporation mentioned in the statement of grounds of opposition (pages 5 and 8 of the letter dated 19 January 2006). These allegations were not contested by the patent proprietor prior to the oral proceedings before the board.

2.6 According to the Rules of Procedure of the Boards of Appeal (RPBA), the statement of grounds of appeal and the reply of the other party shall contain a party's complete case and should *inter alia* specify expressly or by specific reference all the facts, arguments and evidence relied on (Article 10a(2) RPBA). Amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of *inter alia* the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy (Article 10b(1) RPBA). Amendments sought to be made after oral proceedings have been arranged shall not be admitted if they raise

issues which the Board or the other party or parties cannot reasonably be expected to deal with without adjournment of the oral proceedings (Article 10b(3) RPBA).

- 2.7 The resilement of the respondent proprietor at a very late stage of the appeal procedure, viz nearly the end of the oral proceedings, from the acknowledgement in the opposed patent of remote PWM dimming of incandescent lamps presented in the background information of the invention deprives the appellant opponent of the possibility of searching a corresponding published document disclosing this prior art (see also T 87/01, point 5.2).
- 2.8 Admitting this resilement would require in all fairness the adjournment of the oral proceedings to allow the appellant opponent to search for adequate evidence that substantiates his allegations. This could have been done at an earlier stage of the proceedings if the respondent proprietor had timely contested these allegations. Making use of its discretionary power to admit amendments to a party's case (Article 10b(1) and (3) RPBA) the board does not permit the resilement of the respondent proprietor at such a late stage of the proceedings. The same applies to the allegation of the appellant opponent concerning the public nature of the technology used in the Volvo buses, an allegation that was contested by the respondent proprietor only at the oral proceedings.
- 2.9 The appellant opponent may well have been lulled into a feeling of false security by the respondent proprietor's failure to traverse the factual basis of

the appellant's submissions. The board in exercising its discretionary power under Article 10b(1) RPBA against the respondent proprietor is, in effect, applying the generally recognized procedural principle: *Qui tacet consentire videtur ubi loqui debuit* (Justinian's Digest 19, 2, 13 § 11) ("He who is silent when he ought to have spoken is deemed to consent"). The board is conscious of the fact that this is not an absolute principle to be applied without exception, cf G 1/88, OJ 1989, 189 (points 2.1 to 2.4 of the reasons), but nevertheless regards it as applicable in the circumstances of this case as consonant with the legislative purpose of the RPBA.

- 2.10 Document D7 discloses a monolithic integrated circuit working in a pulse width modulation (PWM) mode as a controller of an external power MOS transistor for direct current (DC) applications (page 1/12). The maximum DC supply voltage (V_s) for this circuit is 26V (page 2/12). This allows it to be used eg in vehicles with a 24V DC-power supply such as public buses. In one of the disclosed application circuits the average voltage applied to an incandescent lamp can be continuously varied by the potentiometer R_p (page 8/12; Figure 4). A second application circuit discloses its use to control the brightness of vehicle headlamps using H4 type lamps (Figure 5).
- 2.11 The first application disclosed in document D7, ie the continuous dimming of incandescent lamps, corresponds to the acknowledgement of the prior art in paragraph [0003] of the opposed patent, although document D7 does not explicitly disclose that the controller is located remotely from the lamp. This is however an obvious

option when one controller is employed for dimming several lamps, as it is the case in a bus. The board considers consequently that under the present circumstances the assessment of inventive step should start, as alleged by the appellant opponent, from the state of the art instanced by the Volvo buses in which incandescent lamps are dimmed by a remote voltage controller.

2.12 The problem addressed by the opposed patent having regard to this prior art is therefore the replacement in the known buses of the incandescent lamps by fluorescent lamps, while maintaining as far as possible the PWM-DC controller and the two wire power supply to the lamps, so that modifications to the existent equipment are kept at a minimum.

2.13 Document D11 discloses an arrangement for remote dimming of fluorescent lamps with AC power supplies. A remote voltage control device, which is not shown in Figure 1, encodes a dimming signal on the AC voltage. The AC power with the encoded signal is transmitted over the power feed wires to the filter A and rectifier B. The dimming signal is separated from the AC power by the pre-conditioner C and passed to the dimming interface I, from which a PWM-DC control signal is generated and transmitted to the ballast controller G for controlling the luminosity level of the fluorescent tubes (Figure 1; column 5, line 65 to column 10, line 14; column 17, line 15 to column 18, line 21).

The dimming interface I handles three different types of control signals received at the power line inputs 1', 2'. These signals are provided by: (i) a phase angle

dimmer; (ii) a step dimmer and (iii) a coded continuous-type dimmer (column 17, lines 16 to 27 and Figures 12 to 14). Although the preferred control signal is the coded dimmer signal (iii) in which only a small perturbation is superimposed to the AC voltage to indicate the increase or decrease of the light level by a pre-selected incremental amount, the dimming interface also handles the other two control signals (i) and (ii) for backward compatibility with existing controllers.

- 2.14 The skilled person understands that the output of the controller of document D7 is a PWM-DC control signal and power supply at the same time. This output is thus similar to the rectified phase angle clipping control signal (i) fed into the pre-conditioner C of document D11, which also includes a power component. The electronic ballast disclosed in this document is thus in principle compatible with the voltage controller disclosed in document D7. Although the voltage levels employed in the AC and DC applications are different, the skilled person has no difficulty in adapting the circuit disclosed in document D11 to the voltage levels found in a DC environment. As argued by the appellant opponent, the pre-conditioner stage of D11 makes the electronic ballast look resistive to the power lines (column 8, lines 32 to 34) and the controller of D7 is designed for driving resistive loads as shown in the application circuits of Figures 4 and 5. When the output from the voltage controller of document D7 is fed into the pre-conditioner C of document D11, the power component is separated from the control signal and forwarded to the inverter E, while the PWM control signal is fed into the dimming interface I, as done

previously with the phase angle clipping control signal (i). The dimming interface I can handle the PWM control signal without substantial modifications (column 20, lines 6 to 37, Figure 2c).

2.15 The board is not persuaded by the argument of the respondent proprietor that this adaptation would involve a major redesign of the electronic circuits of document D11 which would be beyond the skill of the normal practitioner of the art. The person skilled in the art has to have the same degree of skill when implementing the invention disclosed in the patent and when interpreting or modifying the state of the art. The opposed patent, however, does not disclose any detailed circuits suitable for implementing the claimed arrangement and discloses the invention by reference to a schematic block diagram (Figure 1). The board is therefore of the view that a skilled person able to implement and design the required electronic circuits for the claimed arrangement on the basis of the schematic block diagram of the patent would have no difficulty in redesigning the circuit of D11 to make it compatible with the voltage levels of the controller of document D7.

2.16 For the above reasons, the arrangement specified in claim 1 of the main request is not considered as involving an inventive step within the meaning of Article 56 EPC.

3. *First and second auxiliary claim requests*

3.1 The claims of the main, first and second auxiliary requests were filed by the respondent proprietor at the

start of the oral proceedings before the board. In contrast to the amendment made to claim 1 of the main request, viz the specification of a **DC** supply voltage, which was a response to the novelty objection raised by the appellant opponent in his last reply before the oral proceedings and even anticipated by the appellant opponent in his last submissions, the amendments made to claim 1 of the first and second auxiliary request were made, according to the respondent proprietor, to distinguish the invention more clearly from the prior art.

3.2 Claim 1 of the first auxiliary request requires in addition to the features of the main request essentially that the voltage controller is a **PWM pulse modulator**. This feature however does not distinguish the voltage controller of the invention from the one disclosed in document D7.

3.3 Claim 1 of the second auxiliary request specifies in addition to the features of the first auxiliary request essentially that the arrangement is **for controlling the fluorescent lamps in a vehicle having a low voltage DC power supply**. However, as discussed previously with respect to the main request, the board considers that Volvo buses having a PWM-DC dimming control for incandescent lamps were part of the prior art, as maintained by the appellant opponent. Consequently, this feature also fails to distinguish the invention from the prior art.

3.4 The first and second auxiliary claim requests are therefore not admitted, being belated and not clearly allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside
2. The patent is revoked.

Registrar

Chair

S. Sánchez Chiquero

R. G. O'Connell