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Datasheet for the decision of 26 April 2019

Case Number: T 1522/14 - 3.5.02

Application Number: 08725195.5

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Language of the proceedings: EN

Title of invention:
Systems and methods for split processor control in a solid state lighting panel

Applicant:
Cree, Inc.

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - obvious alternative

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Case Number: T 1522/14 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 26 April 2019

Appellant: (Applicant)	Cree, Inc. 4600 Silicon Drive Durham, NC 27703 (US)
Representative:	Boult Wade Tennant LLP 5th Floor, Salisbury Square House 8, Salisbury Square London EC4Y 8AP (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 28 January 2014 refusing European patent application No. 08725195.5 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	R. Lord
Members:	C. Vassoille
	W. Ungler

Summary of Facts and Submissions

I. The applicant (appellant) filed an appeal against the decision of the examining division to refuse European patent application no. 08 725 195.5, which is based on the international application published under the PCT as WO 2008/100394 A2.

II. In the decision under appeal, the examining division came to the conclusion that the subject-matter of claim 1 of the main request did not fulfil the requirements of Articles 84, 123(2) and 56 EPC. The subject-matter of claim 1 of the first and the second auxiliary request was considered to not fulfil the requirements of Articles 123(2) and 56 EPC.

III. With the statement of grounds of appeal, the appellant filed a new main request as well as a new first and a new second auxiliary request.

IV. In a communication under Article 15(1) RPBA, the board informed the appellant that the subject-matter of claim 1 of the main request was provisionally considered to not fulfil the requirements of Article 123(2) EPC and also did not seem to involve an inventive step within the meaning of Article 56 EPC. The board further informed the appellant that the subject-matter of claim 1 of the first and the second auxiliary request did not seem to fulfil the requirements of Articles 84, 123(2) and 56 EPC.

V. With letter dated 25 March 2019, the appellant filed claims according to a new main request as well as a new first and a new second auxiliary request. The appellant further withdrew the request for oral proceedings and requested a decision on the basis of the newly filed

requests and arguments submitted with the same letter. The appellant further informed the board that they would not attend the oral proceedings in the event that oral proceedings would take place as scheduled. Thus the appellant requested that the decision under appeal be set aside and a patent be granted on the basis of the claims of the main request, or if that was not possible on the basis of the claims of the first or second auxiliary request, all filed with letter dated 25 March 2019.

VI. Oral proceedings before the board were held on 26 April 2019 in the absence of the appellant.

VII. The following document cited in the proceedings before the examining division is relevant for the present decision:

D1: WO 02/076150 A1

VIII. Claim 1 of the main request reads as follows:

"A system (200; 300) for controlling a solid state lighting panel (100; 170) including a plurality of light emitters (108), the system comprising:
a plurality of current drivers (154, 172) operative to provide current to the plurality of light emitters;
a plurality of sensors (148, 150, 182, 183, 184) operative to monitor performance of the plurality of light emitters;
a colour management unit (180) that is configured to receive a plurality of performance signals including chromatic data from RGB color sensors (150) or photo sensors (183) among the plurality of sensors and is operative to generate colour management information;
and **characterised in that** the system further comprises:

a first controller (142, 176) operative to perform colour management processing in response to the colour management information and to generate duty cycle data thereby; and
a second controller (152, 174) operative to receive the duty cycle data, to control the plurality of current drivers and to poll the first controller for updated duty cycle data,
wherein the colour management unit is operative to generate color management information by using processing resources of the first controller to perform intensity and/or color hue calculations based in part on the chromatic data."

IX. Claim 1 of the appellant's first auxiliary request differs from the main request in that the characterising portion has been amended as follows:

"a first controller (142, 176) operative to perform colour management processing in response to the colour management information and in response to inputs received from other sensors among the plurality of sensors and to generate duty cycle data thereby, the other sensors being operable to provide other data comprising temperature data; and
a second controller (152, 174) operative to receive the duty cycle data, to control the plurality of current drivers and to poll the first controller for updated duty cycle data,
wherein the colour management unit is operative to generate the colour management information by using processing resources of the first controller to perform intensity and/or color hue calculations based in part on the chromatic data." (addition indicated by underlining)

X. Claim 1 of the appellant's second auxiliary request differs from the main request in that the first feature of the characterising portion has been amended as follows:

"a first controller (142, 176) operative to perform colour management processing in response to the colour management information, in response to other sensors among the plurality of sensors and in response to a user input (178) and to generate duty cycle data thereby, the other sensors being operable to provide other data comprising temperature data" (addition indicated by underlining)

XI. The appellant's arguments as far as they are relevant for the present decision were as follows:

Main request - inventive step

Document D1 was considered as closest prior art. This document discussed adjusting a lighting system in commercial displays. D1 lacked at least the feature that a second controller is operative to poll a first controller for updated duty cycle data. The present invention was therefore novel over D1.

Starting from D1, the skilled person sought to provide an improved control of solid state lighting panel, especially for display operations. The solution of the present invention used an arrangement between the first controller that generates duty cycle data and a second controller that controls current drivers before the light emitters, such that the second controller polls the first controller for updated duty cycle data.

The solution of the present invention provided surprising advantages. As explained in the description, the inventors had recognised that by causing the second controller to poll the first controller for updated duty cycle data, operations in the second controller could be less susceptible to interruption. Interruption of this second controller could degrade the display operations, so avoiding this interruption may provide a significant improvement in this area. Neither the solution of the present invention nor its technical advantages was obvious to the skilled person based on the prior art. The present invention therefore involved an inventive step.

In the context of the claims, the specific polling operation recited therein was also not inherent in D1. Inherence required that an element be necessarily present. Instead, while other communication techniques may be available and thus the polling was not necessarily present, the recited polling was specific to the recited arrangement so that the susceptibility of the emitter driver controller to interruption based on delays in the color management controller may be reduced. Accordingly, in the context of the claim recitations, the polling operation was based on an inventive step.

First auxiliary request - inventive step

The interaction between the first controller and the second controller (specifically the polling mechanism) was not found in any of the cited prior art documents. The specific configuration of processors according to the present invention had significant advantages. In particular, it allowed individualised processing of the chromatic data (in the colour management unit) and non-

chromatic data (in the first controller) together with separate processing of the duty cycle data (in the first controller) and driver signal generation (in the second controller) and polling between the two controllers to ensure information was regularly updated. This provided a significantly more efficient circuitry for controlling a solid state lighting panel than shown in the prior art. As a consequence, the subject-matter of claim 1 of the first auxiliary request was not obvious to the skilled person.

A separation of the analysis of chromatic and non-chromatic data was demonstrated in claim 1 by the recitation of a separate "colour management unit (180) that is configured to receive a plurality of performance signals including chromatic data from RGB color sensors (150) or photo sensors (183) among the plurality of sensors and is operative to generate colour management information that includes intensity and/or colour hue information".

Second auxiliary request - inventive step

Document D1 included a user interface (63), however the system of D1 provided no opportunity for resolving the user input separately from the second controller (the duty cycle microprocessor). As such, the benefit of avoiding interruption delays to the second processor based on delays in the first controller (the color management controller) were unavailable to the device of D1.

The user interface of document D1 appeared to be banks of PCB mounted switches for statically setting the color and lighting level for a freezer and turning the lights on and off based on an ON/OFF switch (see figure

4). Therefore, it was not obvious to the skilled person to modify D1 to separate the control operations as defined in claim 1.

Reasons for the Decision

1. The appeal is admissible

2. Non-attendance at the oral proceedings

2.1 The board held oral proceedings as scheduled in the absence of the appellant.

2.2 The appellant could reasonably have expected that during the oral proceedings the board would consider the objections and issues raised in the communication annexed to the summons to oral proceedings, which form the basis for the present decision. In deciding not to attend the proceedings, the appellant effectively chose not to avail themselves of the opportunity to present their observations and counter-arguments orally but instead to rely on their written case (see Article 15(3) RPBA). In reply to the board's communication, the appellant filed a written statement together with new requests, which thus form the appellant's written case.

2.3 In the present case, the new requests were amended to overcome the board's objections with regard to Articles 84 and 123(2) EPC, whereas the objections regarding Article 56 EPC were not addressed by the amendments. The reasons on which the present decision is based do not constitute a departure from grounds or evidence previously put forward which would require that the appellant be given a further opportunity to comment.

The board was therefore in a position to announce a decision at the end of the oral proceedings as foreseen by Article 15(6) RPBA.

3. Main request - inventive step (Article 56 EPC)

3.1 In the decision under appeal, the examining division found that the subject-matter of claim 1 differed from document D1 in that the second controller is operative to poll the first controller for updated duty cycle data. The appellant did not contest the examining division's assessment of the distinguishing feature and considered the resulting objective technical problem as how to provide an improved control of solid state lighting panel, especially for display operations.

3.2 The appellant's main argument in this respect refers to the advantage of polling in the context of the present invention, that is the operations of the emitter driver controller to poll the color management controller for updated duty cycle data may provide that the operations of the emitter driver controller are less susceptible to interruption. In the decision under appeal, however, the examining division came to the conclusion that polling techniques were well known in the art, and the advantage mentioned in paragraph [0044] of the application as filed, i.e. less susceptibility to interruptions, was considered to be an inherent characteristic of the second controller polling the first one and thus not being interrupted by it. According to the appellant, considering the description in paragraph [0044] of the application as filed, the specific polling operations recited in claim 1 would not be inherent in the context of the present claims.

3.3 The board is not convinced by the appellant's argument. Rather, polling is a well defined technical term which implies that the second controller checks the first controller in regular intervals without interrupting the processing thereof. The advantage of polling of operations in the emitter driver controller to be less susceptible to interruptions is therefore inherent to this technique, as has been found by the examining division in the decision under appeal. The mere fact that this inherent advantage is explicitly mentioned in paragraph [0044] of the present application with reference to the emitter driver controller and the colour management controller, does not mean that the advantage of polling was first discovered by the inventors of the present application, contrary to what was argued by the appellant. It is also not apparent that the implementation of a polling technique would cause particular difficulties in the present case.

3.4 The board concludes that the use of polling and interrupts in communication protocols, and their relative advantages and disadvantages, forms part of the common general knowledge of any skilled person working with controllers or processors. The selection of one of the limited number of well known communication techniques was further necessary to realise a data transfer from the first controller to the second controller and the selection of polling was therefore obvious.

3.5 The subject-matter of claim 1 of the main request therefore does not involve an inventive step within the meaning of Article 56 EPC.

4. First auxiliary request - inventive step (Article 56 EPC)

4.1 The board is not convinced by the appellant's argument that claim 1 of the first auxiliary request demonstrates an individualised processing of "chromatic data" (in the colour management unit) and "non-chromatic data" (in the first controller). To the contrary, claim 1 relates to a colour management unit which is "configured to receive a plurality of performance signals including chromatic data" (emphasis added). The colour management control unit according to claim 1 thus may receive other performance signals such as signals from a thermal sensor (see the description in paragraph [0043]: "The performance sensors 146 can include, for example, thermal sensors...") in order to generate colour management information. In this respect, claim 1 in accordance with the original disclosure further recites that "the colour management unit is operative to generate the colour management information ... based in part on the chromatic data". It is thus clear from the wording of claim 1 that the calculation of colour management information is not restricted to or exclusively based on chromatic data but is also be based on data from "other sensors".

4.2 Furthermore, claim 1 recites that the colour management unit uses processing resources of the first controller to perform intensity and/or color hue calculations and that the first controller is operative to perform colour management processing in response to colour management information. Any further structural relationship between the colour management unit and the first controller is however not defined in claim 1. In

particular, it is not excluded that both form a structural unit.

4.3 The board further notes that claim 1 leaves the meaning of "colour management processing" and "color management information" entirely open. As far as the latter is concerned, claim 1 only vaguely relates to "intensity and/or color hue calculations". In particular, claim 1 does not contain any definition of how the system is configured to calculate duty cycle data, be it on the basis of colour management information or on the basis of inputs received from "other sensors".

4.4 The board concludes that the wording of claim 1 is so broad in meaning that it can not be understood in a restricted sense of individualised processing of chromatic data and data from "other sensors", contrary to what was argued by the appellant.

4.5 The appellant further argued that the system of claim 1, *inter alia* by allowing for an individualised processing of chromatic data in the colour management unit and the "non-chromatic" data in the first controller, provides a significantly more efficient circuitry for controlling a solid state lighting panel than shown in the prior art. Apart from the fact that claim 1 does not reflect an individualised processing of chromatic data and data from "other sensors", the board further observes that the appellant did not provide a reasonable justification for such an alleged advantage.

4.6 As regards inventive step of the subject-matter of claim 1 according to the first auxiliary request, the examining division in the decision under appeal (see section 9.1 of the reasons for the decision) correctly

found that document D1 discloses "other sensors" configured to measure "non-chromatic" data, like the LED heat sink temperature sensor 41 as well as further current and voltage sensors (see page 5, lines 10 to 11 and 19 to 21). D1 further discloses that chromatic data and data from "other sensors" are used to perform color management processing (see page 5, lines 11 to 15) and the alleged difference between D1 and the subject-matter of claim 1 of the first auxiliary request therefore does not exist. The subject-matter of claim 1 consequently differs from D1, in accordance with the subject-matter of claim 1 of the main request, only in that the second controller is operative to poll the first controller for updated duty cycle data. The grounds set out with regard to an inventive step of the subject-matter of claim 1 of the main request therefore also apply to claim 1 of the first auxiliary request (see the reasons under point 3 of the present decision).

4.7 The subject-matter of claim 1 of the first auxiliary request therefore does not involve an inventive step within the meaning of Article 56 EPC.

5. Second auxiliary request - inventive step (Article 56 EPC)

5.1 Claim 1 of the second auxiliary request in comparison to claim 1 of the first auxiliary request comprises the additional feature that the first controller is operative to perform colour management processing also in response to a user input. The appellant did not contest that document D1 discloses a user interface 63 but argued that the system of document D1 provided no opportunity for resolving the user input separately from the second controller. The board does not agree

with this line of argument. To the contrary, it is clear from document D1 that the user input ("user interface system 63") is connected to microprocessor 50, independent from the "PWM generation and isolation block 61", in order to influence colour management processing (see page 5, lines 29 ff.). Since the user interface is not defined in more detail in claim 1, it is also irrelevant that the interface in D1 provides for a manual adjustment of color and lighting levels.

5.2 The appellant further argued that D1 did not disclose that the microprocessor can provide independent control of the plurality of current drivers even if the first controller was performing colour management processing based on chromatic and non-chromatic sensors and a user input. The board is not convinced by the appellant's argument because document D1 explicitly discloses a "PWM generation and isolation block 61", which receives the control signals (corresponding to "duty cycle data") necessary for PWM generation from the microprocessor 50 (see page 4, lines 13 to 15 and figure 1). It is therefore not apparent to the board why controlling of a plurality of current drivers by means of block 61, independent from the colour management processing in the first controller (microprocessor 50), should not be possible, and a convincing explanation from the appellant is missing in this regard.

5.3 The board concludes that document D1 discloses a first controller (50) operative to perform colour management processing in response to a user input (63). The alleged difference between D1 and the subject-matter of claim 1 of the second auxiliary request in this respect therefore does not exist. The subject-matter of claim 1 of the second auxiliary request consequently differs

from D1, in accordance with the subject-matter of claim 1 of the main request, only in that the second controller is operative to poll the first controller for updated duty cycle data. The grounds set out with regard to an inventive step of the subject-matter of claim 1 of the main request therefore also apply to claim 1 of the second auxiliary request (see the reasons under point 3 of the present decision).

5.4 The subject-matter of claim 1 of the second auxiliary request therefore does not involve an inventive step within the meaning of Article 56 EPC.

6. Since none of the appellant's requests was allowable, the appeal had to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

U. Bultmann R. Lord

Decision electronically authenticated