



(11) **EP 2 273 851 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**11.05.2011 Bulletin 2011/19**

(51) Int Cl.:  
**H05B 33/08 (2006.01)**

(43) Date of publication A2:  
**12.01.2011 Bulletin 2011/02**

(21) Application number: **09163687.8**

(22) Date of filing: **24.06.2009**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR**  
 Designated Extension States:  
**AL BA RS**

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(54) **System and method for controlling LED cluster**

(57) In one embodiment, a control system is for controlling a lighting system which comprises a cluster (20) of different colour LEDs. The control system comprises a first control unit (24) for generating amplitude values for the different LEDs of the cluster to provide a desired colour point and a second control unit (38) for controlling

pulse width values for the different LEDs to provide a desired brightness. Current sources (32) are provided for individually driving the LEDs of the cluster.

This system allows the control of colour point to be independent from the control of brightness of the LED cluster. This provides a low cost solution and a fast, accurate and flexible control to a LED cluster.

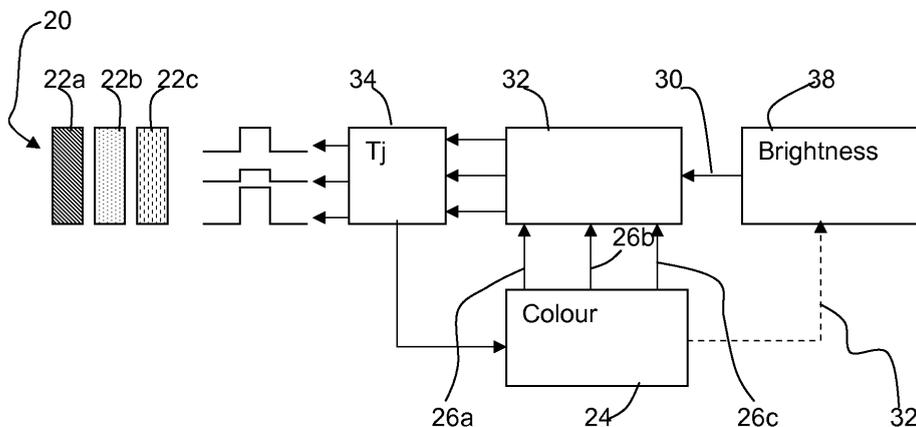


Figure 4

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EUROPEAN SEARCH REPORT

Application Number  
EP 09 16 3687

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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-/--			
<del>The present search report has been drawn up for all claims</del>			
Place of search <b>Munich</b>		Date of completion of the search <b>31 March 2011</b>	Examiner <b>Ferla, Monica</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.02 (P04C01)



EUROPEAN SEARCH REPORT

Application Number  
EP 09 16 3687

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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<del>The present search report has been drawn up for all claims</del>			
Place of search <b>Munich</b>		Date of completion of the search <b>31 March 2011</b>	Examiner <b>Ferla, Monica</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

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EPO FORM 1503 03/02 (P04C01)



Application Number

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**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing claims for which payment was due.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:  
1-3, 5-9, 12-15
- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:
- The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION  
SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 2, 3, 13(completely); 1, 9, 12(partially)

A control system/method controlling a multicolour LED cluster wherein a first control unit produces a current amplitude control signal to provide a desired colour output and a second control unit a pulse width control signal to provide a desired brightness, wherein colour adjustment is done at a predetermined brightness which is constant for all colour points.

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2. claims: 4(completely); 1, 9(partially)

A control system/method controlling a multicolour LED cluster wherein a first control unit produces a current amplitude control signal to provide a desired colour output and a second control unit a pulse width control signal to provide a desired brightness, wherein the first control unit provides brightness information concerning the generated amplitude values to the second control unit. The control of brightness and colour point are no longer splitted and the two control units are now interdependent.

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3. claims: 5, 14(completely); 1, 7-9, 12(partially)

A control system/method controlling a multicolour LED cluster wherein a first control unit produces a current amplitude control signal to provide a desired colour output and a second control unit a pulse width control signal to provide a desired brightness further comprising a temperature sensing arrangement inferring the junction temperature from measurement of LED forward voltage drop.

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4. claims: 6, 15(completely); 7-9(partially)

A control system/method for controlling single-colour LED cluster producing a current amplitude control signal to maintain a desired brightness under changing temperature conditions and a pulse width control signal to provide a desired brightness.

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5. claims: 10, 11

Lighting system comprising a control system for controlling a multicolour LED cluster and a colour output characteristic determination system for determining the colour output characteristic of the LED cluster.

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**LACK OF UNITY OF INVENTION  
SHEET B**

Application Number  
EP 09 16 3687

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 09 16 3687

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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31-03-2011

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