

## Appeal decision

Appeal No. 2014- 24184

USA

Appellant

BRIDGELUX INC.

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Patent Attorney

SAEGUSA & PARTNERS

The case of appeal against the examiner's decision of refusal of Japanese Patent Application 2011-552045, entitled "LIGHT SOURCES UTILIZING SEGMENT LEDS TO COMPENSATE FOR MANUFACTURING VARIATIONS IN THE LIGHT OUTPUT OF INDIVIDUAL SEGMENTED LEDS" [International Publication on September 2010, WO2010/098922, National Publication on August, 23, 2012, National Publication of International Patent Application No. 2012-519377] has resulted in the following conclusion.

### Conclusion

The appeal of the case was groundless.

### Reasons

#### 1. The Inventions of the application

The application was filed on January 26, 2010 (an international filing date) on the basis of Priority Claim under the Paris Convention filed on February 26, 2009 to the foreign patent office, USPTO. A written amendment was submitted on May 8, 2014 and an examiner's decision of refusal was issued on July 18, 2014. An appeal against the examiner's decision of refusal was made on November 27, 2014 and a written amendment was submitted at the same time. While the inventions relating to claims of the application are specified according to Claims 1 to 10 of the written amendment dated November 27, 2014, the invention relating to Claim 1 (hereinafter referred to as "the Invention") is as follows.

"A light source comprising:

a plurality of Segmented LEDs connected in parallel to a power bus, said bus accepting a variable number of Segmented LEDs, said number being chosen to provide a predetermined light output for said light source; and

a controller that receives AC power and provides a power signal on said power bus, wherein each Segmented LED is characterized by a driving voltage that is greater than 3 times the driving voltage of a single joined LED, having the same area as said Segmented LED, fabricated in the same material system as said Segmented LED."

## 2. Cited Document

Japanese Unexamined Patent Application Publication No. 2009-9846 (hereinafter referred to as "Cited Document 1"), which was distributed before the priority date of the application and is cited in the reasons for refusal of the examiner's decision, has the following descriptions together with drawings.

A "[0001]

The invention relates to a lighting fixture and a lighting apparatus having a light-emitting element such as a light-emitting diode."

B "[0022]

The embodiments of the invention are explained below with reference to the drawings. In a plurality of attached drawings, the same reference sign is assigned to the same or a corresponding part.

[0023]

FIG. 1 is a partial notch circuit diagram of a lighting fixture 1 associated with the first embodiment of the invention, and FIG. 2 is a plan view of a light-emitting diode module illustrating one example of a lighting apparatus, which is a part of the lighting fixture 1.

[0024]

As shown in FIG. 1, the lighting fixture 1 has a plurality of child modules 3a, ..., 3n electrically connected to a parent module 2.

[0025]

The parent module 2 has a bias circuit 2c connected to a constant-current-power-supply 2b connected to a commercial alternating current power supply 2a. The constant-current-power-supply 2b includes a rectification circuit that rectifies the commercial alternating current power supply to a direct current of predetermined voltage, and a constant current circuit that make the direct current to be constant at a predetermined current value. An LED (light-emitting diode) series circuit 2d, which is

an example of a light-emitting part, is connected in parallel to the bias circuit 2c. Each of the child modules 3a to 3n also respectively includes the LED series circuit 2d. A light-emitting diode 4 may include only a light-emitting diode chip or may include a phosphor layer that emits light of a required color with light emission of the light-emitting diode chip.

[0026]

Each LED series circuit 2d is a series circuit of a serially connected plurality of light-emitting diodes 4, 4, ... inserted with an NPN type bipolar transistor 5, for instance. The bipolar transistor 5 has an emitter connected to a resistor (emitter resistor) 6 for making an output current of the transistor 5 to be constant and has a base connected to an output side of the bias circuit 2c, and respectively evenly provides each LED series circuit 2d with a current of a predetermined constant value.

[0027]

FIG. 2 is an outline plan view of the child modules 3a to 3n. Each of the child modules 3a to 3n has a receiving terminal part 8 and a transmitting terminal part 9 side by side at both right and left end parts on one surface of a rectangular substrate 7, for instance."

C "[0037]

By sequentially connecting receiving terminal parts 8 of unillustrated other child modules 3a to 3n to transmitting terminal parts 9 with connecting members such as connectors, a plurality of child modules 3a to 3n may be easily and quickly attached or detached, and the number of the child modules 3a to 3n to be connected to the parent module 2 may be easily increased or decreased."

D "[0053]

FIG. 9 is a partial notch circuit diagram of a lighting fixture 1C associated with the seventh embodiment of the invention. The lighting fixture 1C is mainly characterized by replacing the constant-current-power-supply 2b and the bias circuit 2c illustrated in FIG. 1 above with a constant voltage power supply 2bC to eliminate the transistor 5.

[0054]

According to the lighting fixture 1C, each light-emitting diode 4 may be driven for lighting by the constant voltage power supply 2bC.

[0055]

FIG. 10 is a schematic diagram illustrating by partially omitting a configuration of child modules 3aC, 3bC, ..., 3nC driven at the constant voltage power supply 2bC.

[0056]

Each of the child modules 3aC, 3bC, ..., 3nC is characterized by that, between one receiving terminal 8b and one transmitting terminal 9b, one LED series circuit 2d is respectively connected."

When the D is considered by referring to the B and the C, it may be recognized that the Cited Document 1 has a reading as the seventh embodiment of the invention:

"The lighting fixture 1C has a configuration in which the plurality of child modules 3a, ..., 3nC is electrically connected to the parent module 2C,

the parent module 2C has a configuration in which an LED (light-emitting diode) series circuit 2d formed by serially connecting a plurality of light-emitting diodes 4, 4, ... is connected to the constant voltage power supply 2bC connected to the commercial alternative current power supply 2a,

each of the child modules 3aC to 3nC also respectively includes an LED series circuit 2d,

each of the child modules 3aC to 3nC respectively has the receiving terminal part 8 and the transmitting terminal part 9 side by side at both right and left end parts on one surface of one rectangular substrate 7, for instance,

by sequentially connecting the receiving terminal parts 8 of the other child modules 3aC to 3nC to the transmitting terminal parts 9 with the connecting members such as connectors, the plurality of child modules 3aC to 3nC may be easily and quickly attached or detached, and the number of child modules 3aC to 3nC to be connected to the parent module 2C may be easily increased or decreased." (Hereinafter referred to as "Cited Invention".)

### 3. Comparison

The Invention and the Cited Invention are compared.

- (1) "The lighting fixture 1C" of the Cited Invention may be said to be "a light source."
- (2) In the Cited Invention, a line connecting "the constant voltage power supply 2bC" to "the LED series circuit 2d" included in the parent module 2C and each of the child modules 3aC to 3nC"; namely, in FIG. 9 of the Cited Document 1, an upper line and a lower line extending toward right and left that connect each of "the LED series circuit 2d" to "the constant voltage power supply 2bC" correspond to "the power buses" of the Invention.

Since [0015] of the Description of the present application has a description reading: "The details of the Segmented LED are described below. For this explanation, it is

sufficient to pay attention that each Segmented LED may be defined to be a single LED die mutually connected in series by being divided into N segments, where  $N > 1$ , normally between 2 and 100. Each segment is actually a small LED," "the Segmented LED" of the Invention is recognized to be formed by connecting small LEDs in series, and coincides with "the LED series circuit 2d" of the Cited Invention in terms of "the LED series circuit (formed by connecting a plurality of light-emitting diodes in series)."

Since the Cited Invention is characterized by "the plurality of child modules 3aC to 3nC (each including an LED series circuit 2d) may be easily and quickly attached and detached, and the number of child modules 3aC to 3nC to be connected to the parent module 2C is easily increased or decreased," the number of "the LED series circuits 2d" to be connected to the power tub is variable.

In the Cited Invention, it is recognized that increasing and decreasing the number of child modules 3aC to 3nC to be connected to the parent module 2C is for making a light output of the lighting fixture 1C to be a predetermined output.

From the above, the Invention and the Cited Invention are identical in terms of including "a plurality of LED series circuits, wherein the plurality of LED series circuits are connected in parallel to the power tub, the number of the LED series circuits to be connected to the power tub is variable, and the number is so selected that the light source outputs a predetermined light output."

(3) "The commercial alternating power supply 2a" and "the constant voltage power supply 2bC" of the Cited Invention respectively correspond to "the AC power supply" and "a controller" of the Invention, and the Invention and the Cited Invention are identical in terms of including "a controller for transmitting a power supply signal to the power tub by receiving the AC power supply."

(4) Accordingly, the two are identical in terms of a light source which includes "a plurality of LED series circuits, wherein the plurality of LED series circuits is connected in parallel to the power tub, the number of LED series circuits to be connected to the power tub is variable, and the number is so selected that the light source outputs a predetermined light output; and

a controller for transmitting a power supply signal to the power tub by receiving the AC power supply."

(5) Meanwhile, the two are different in terms of the point below.

Regarding the "LED series circuit", the Invention contains "the Segmented LED" and each Segmented LED of the Invention is driven at a driving voltage of three times the driving voltage of a single joined LED made of the same material system and having the same area with the Segmented LED while the "LED series circuit" of the Cited

Invention differs from such a Segmented LED.

#### 4. Judgment

The different feature is examined.

"The Segmented LED" used in the Invention per se is well-known as shown in National Publication of International Patent Application No. 2008-544569 (refer to FIG. 5, FIG. 6, and FIG. 9, and [0046] to [0051], hereinafter, referred to as "Cited Document 2") cited for the reasons for refusal of the examiner's decision and Japanese Unexamined Patent Application Publication No. 2002-359402 (refer to FIG. 7A to FIG. 8B, and [0005] to [0012], hereinafter referred to as "Cited Document 3").

To use "the Segmented LED" for "the LED series circuit 2d" of the Cited Invention, which is formed by connecting a plurality of light-emitting diodes 4, 4, ... in series, could have easily been derived by a person skilled in the art, taking into consideration the Cited Document 3 which states that the use of "the Segmented LED" is preferable (See [0011]: "A monolithic device, according to this embodiment, is preferred over a conventional approach of attaching individual LED dice in series. In the conventional approach, the total area taken up by the LED die is increased because of the tolerances required by die-attach machines." and [0012]: "In accordance with the invention, monolithic series arrays of LEDs may offer several advantages. First, monolithic arrays cut down on the number of connections to external circuitry, such as a submount,")

Besides, as to how many segments is to be used (namely, the number of small LEDs to be connected in series) is only a matter of design, and, as a result, no significant difficulty is recognized in selecting three for the number.

It is obvious to a person skilled in the art that a Segmented LED with three segments "is driven at three times the driving voltage of a single joined LED having the same area as said Segmented LED made of the same material system as said Segmented LED" (in this respect, if necessary, refer to a description in [0015] of the Description of the present application, "the driving voltage needed to run a segmented LED is substantially equal to N times the voltage needed to run a conventional LED in the same material system," or a description in [0011] of the Cited Document 3, "The array in FIG. 8A has four serially connected LEDs that are electrically isolated via etching. ... This device thus operates at four-times the voltage and one-fourth the current of a single LED with the same active region area.").

The effects exerted by the Invention may be predictable to a person skilled in the art and unremarkable according to the Cited Document 3 (see [0011]"This higher voltage, lower current operation places less demand on the electronic driver circuit for the LED

array. In fact, the electronic driver circuit can run at higher efficiency at higher voltages, improving the overall efficiency of the LED lighting system", or [0012], "as described above, monolithic serial arrays operate at a higher voltage than an individual LED. A higher operating voltage can simplify the design of a power supply to drive the LED array.").

#### 5. Summary of Judgment

As described above, the Invention could be invented easily by a person skilled in the art on the basis of the invention described in Cited Document 1, well-known arts, and described matters in Cited Document 3, and, thus, the Invention cannot obtain a patent in accordance with the provisions of Article 29(2) of the Patent Act.

Therefore, the appeal decision shall be made as described in the conclusion.

July 30, 2015

Chief administrative judge: YOSHINO, Kimio

Administrative judge: KONDO, Yukihiro

Administrative judge: TAKA, Yoshinori