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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CHI KEUNG CHAN, CHAK HAU PANG, FEI HONG LI,
YUE KWONG LAU, JUN ZHANG, and DAVID TODD EMERSON

Appeal 2014-008816
Application 13/153,888
Technology Center 2800

Before JEFFREY S. SMITH, JON M. JURGOVAN, and
KARA L. SZPONDOWSKI, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1–24, which are all the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

Illustrative Claim

1. A light emitting diode (LED) package comprising:
 - a lead frame comprising a plurality of electrically conductive chip carriers;
 - an LED disposed on each one of the plurality of electrically conductive chip carriers; and
 - a plastic casing at least partially encasing the lead frame, wherein a profile height of the LED package is less than 1.0mm.

Prior Art

Aizar	US 2009/0129085 A1	May 21, 2009
Hayashi	WO 2008/081696 A1	Dec. 13, 2007
Kong	WO 2008/130140 A1	Apr. 17, 2008

Examiner's Rejections on Appeal

Claims 1–8 and 10–24 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Aizar and Kong. (Final Act. 3–11.)

Claim 9 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Aizar, Kong, and Hayashi. (Final Act. 11.)

ANALYSIS

We adopt the findings of fact made by the Examiner in the Final Action and Examiner's Answer as our own. We concur with the conclusions reached by the Examiner for the reasons given in the Examiner's Answer. We highlight the following for emphasis.

Section 103 rejections of claims 1–9

Appellants' disclosure relates to a miniature surface mount device (SMD) with large pin pads. Title. In particular, the disclosure relates to plastic leaded chip carriers that house light emitting diode (LED) devices. Spec. ¶ 2. Appellants disclose a problem with the prior art is that LEDs can generate a significant amount of heat that is difficult to dissipate using conventional techniques. Spec. ¶ 7. Appellants state that the design objectives of the miniature SMD package include maintaining a relatively low operating temperature. Spec. ¶ 7. To achieve this, Appellants disclose a common mounting pad with an increased area to improve heat dissipation. Spec. ¶¶ 27, 39.

Claim 1 recites an LED package comprising "a plurality of electrically conductive chip carriers" with an LED disposed on each chip carrier, "wherein a profile height of the LED package is less than 1.0mm." The Examiner finds Aizar teaches an LED package with a plurality of electrically conductive chip carriers. The Examiner further finds making the profile height of the LED package less than 1.0 mm was within the level of ordinary skill in the art as taught by Kong. Final Act. 3.

Appellants contend Kong teaches a side emission LED package, and Aizar teaches a top emission package. App. Br. 8; Reply Br. 3. According

to Appellants, one of ordinary skill in the art could not combine the teachings of the top emission LED package of Aizar with the teachings of the side emission LED package of Kong. App. Br. 8–9; Reply Br. 2–3. However, Paragraph 32 of Kong discloses that the teachings apply to both top and side emission LED packages. Appellants’ contention that Kong’s teachings could not be combined with the top emission LED package of Aizar is inconsistent with Paragraph 32 of Kong.

Appellants also contend that combining the teachings of an LED package for a single LED taught by Kong with the teachings of multiple LEDs of Aizar would increase the height of the LED package. App. Br. 8–9. Appellants’ contention is based on the premise that using multiple LEDs as taught by Aizar in the LED package of Kong results in an LED package with a greater surface area. App. Br. 9. However, Appellants have not persuasively explained why an increase in surface area would result in an increase in height. Claim 1 recites that “a profile height,” not a surface area, “of the LED package is less than 1.0mm.” The Examiner cites Kong as evidence to show reducing the profile height of the LED package of Aizar to less than one millimeter was within the level of ordinary skill, and Appellants provide no persuasive evidence to the contrary.

Appellants contend Kong is not analogous to the claimed invention. App. Br. 9–12; Reply Br. 4. Our reviewing court addressed the issue of determining whether a reference is analogous art:

A reference qualifies as prior art for an obviousness determination under § 103 only when it is analogous to the claimed invention. Two separate tests define the scope of analogous prior art: (1) whether the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor’s endeavor,

whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved. A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem. If a reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem, and that fact supports use of that reference in an obviousness rejection.

In re Klein, 647 F.3d 1343 (Fed. Cir. 2011) (internal citations omitted).

Here, the Kong reference (1) is from the same field of endeavor as the claimed invention, namely, an LED package with an electrically conductive lead frame (Spec. ¶¶ 2–4; Kong ¶¶ 1, 6–8, and 10–12) and (2) is reasonably pertinent to the particular problem with which the inventors were faced, namely, improving thermal characteristics of an LED package (Spec. ¶¶ 6–7; Kong ¶ 17).

We sustain the rejection of claim 1 under 35 U.S.C. § 103. Appellants do not present arguments for separate patentability of claims 2–9, which fall with claim 1.

Section 103 rejection of claims 10–19

Claim 10 recites a “casing defining a cavity,” and “a depth of the cavity is less than 0.6mm.” The Examiner finds Paragraph 55 of Kong teaches the claimed depth. Final Act. 6. Appellants contend Kong is not analogous art because Kong only teaches one LED. App. Br. 12. We find Appellants' contention unpersuasive for the reasons given in our analysis of claim 1.

We sustain the rejection of claim 10 under 35 U.S.C. § 103. Appellants do not provide arguments for separate patentability of claims 12–14 and 16–19, which fall with claim 10.

Section 103 rejection of claim 15

Claim 15 recites “a surface area of the upper surface of each electrically conductive connection part is less than about one half of a surface area of the upper surface of each electrically conductive chip carrier.” The Examiner finds Figure 7 of Aizar teaches this limitation. Ans. 6–7. Appellants contend the surface areas of chip carriers 122, 132, and 126 of Aizar are only slightly larger than the corresponding connection parts 130, 124, and 134. App. Br. 13. The Examiner finds that a person of ordinary skill in the art would have known that the ratio of the connection part and chip carrier surface area impacts thermal conductivity, and would have optimized the surface area ratio of Aizar using routine experimentation to achieve the claimed surface area ratio. Ans. 6–7. The Examiner further finds that Appellants’ Specification contains no disclosure of the critical nature of the claimed surface area ratio. Ans. 7.

The Examiner has not shown where the prior art teaches changing thermal conductivity of an LED package by varying the ratio of the chip carrier to connection part surface area. In other words, the Examiner has not shown that the prior art recognizes this ratio to be a result effective variable. *See In re Antonie*, 559 F.2d 618 (CCPA 1977). Further, Paragraph 37 of Appellants’ Specification discloses that it is preferable to increase the upper surface area of the electrically conductive chip carriers so they can dissipate heat more effectively, which, contrary to the Examiner’s findings, describes

the critical nature of the claimed surface area. The only description of the benefit of increasing the surface area of the electrically conductive chip carriers is found in Appellants' disclosure. The Examiner's findings are based on impermissible hindsight from Appellants' Specification.

We do not sustain the rejection of claim 15 under 35 U.S.C. § 103.

Section 103 rejection of claim 20

Claim 20 recites "each pixel of the display has a size about 2.8mm or less by about 2.8mm or less." Appellants contend the dimensions of the length 70 and width 80 disclosed in Table 1 of Aizar are both greater than 2.8mm as claimed. App. Br. 14; Reply Br. 8. The Examiner finds that where the only difference between the claimed device and the prior art device is a recitation of relative dimensions, and the relative dimensions do not cause the claimed device to perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. Ans. 8 (citing *In Gardner v. TEC Syst., Inc.*, 725 F.2d 1338 (Fed. Cir. 1984)).

Appellants do not persuasively show how the claimed dimensions cause the claimed device to perform differently than the prior art device. Rather, Appellants contend the top emission LED package of Aizar and the side emission LED package of Kong have different impacts on resolution. Reply Br. 5–6. Appellants do not persuasively address the combination of the top emission package of Aizar with the top emission package of Kong as discussed in our analysis of claim 1.

We sustain the rejection of claim 20 under 35 U.S.C. § 103.

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Section 103 rejections of claims 21–24

Appellants present arguments for claim 20 (App. Br. 14–15; Reply Br. 6) similar to those presented for claims 1 and 20 which we find unpersuasive.

We sustain the rejection of claim 21 under 35 U.S.C. § 103. Appellants do not present argument for separate patentability of claims 22–24, which fall with claim 21.

DECISION

The rejections of claims 1–14 and 16–24 are affirmed.

The rejection of claim 15 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv). *See* 37 C.F.R. § 41.50(f).

AFFIRMED-IN-PART