

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TCT MOBILE (US) INC; TCL CHINA STAR OPTOELECTRONICS
TECHNOLOGY CO., LTD; TCL TECHNOLOGY GROUP
CORPORATION; TTE TECHNOLOGY, INC.; TCL COMMUNICATION
TECHNOLOGY HOLDINGS LIMITED; and TCT MOBILE, INC.,
Petitioners,

v.

SEMICONDUCTOR ENERGY LABORATORY CO., LTD.,
Patent Owner.

IPR2022-00151
Patent 10,680,049 B2

Before DAVID C. McKONE, JENNIFER MEYER CHAGNON, and
NATHAN A. ENGELS, *Administrative Patent Judges*.

ENGELS, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Petitioner filed a Petition for *inter partes* review of claims 1–6 of U.S. Patent No. 10,680,049 B2 (Ex. 1001, “the ’049 patent”). Paper 1 (“Pet.”), 1. Patent Owner filed a Preliminary Response. Paper 12 (“Prelim. Resp.”).

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the information presented in the Petition and any response thereto shows “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018). We have authority, acting on the designation of the Director, to determine whether to institute an *inter partes* review under 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a).

For the reasons set forth below, upon considering the parties’ arguments and the evidence of record, we conclude that the information presented in the Petition fails to establish a reasonable likelihood that Petitioner would prevail in showing the unpatentability of any of the challenged claims. Accordingly, we decline to institute *inter partes* review.

A. Real Parties in Interest

The parties identify the entities listed on the caption page as the real parties in interest. Pet. 3; Paper 9, 1.

B. Related Matters

The parties indicate that the ’049 patent is the subject of *Semiconductor Energy Laboratory Co. v. TCL China Star Optoelectronics Technology Co.*, Case No. 8:21-cv-00554 (C.D. Cal.). Pet. 3; Paper 9, 1.

C. The Challenged Patent

Titled “Light Emitting Device,” the ’049 patent describes an organic light emitting device (“OLED”) formed over a substrate having an insulating

layer. Ex. 1001, 1:30–40, code (54). The '049 patent describes reducing dispersion in electric current of a thin film transistor (“TFT”) controlling an OLED to reduce the variation in luminosity of the OLED. Ex. 1001, 2:53–3:3, code (57). “When the channel length of the TFT that supplies current to the OLED is made longer, the value of the electric current becomes smaller and the simple dispersion . . . decreases.” Ex. 1001, 3:51–53.

The '049 patent describes increasing the channel length in channel formation region depicted in red in annotated version of Figure 5 of the '049 patent copied below.

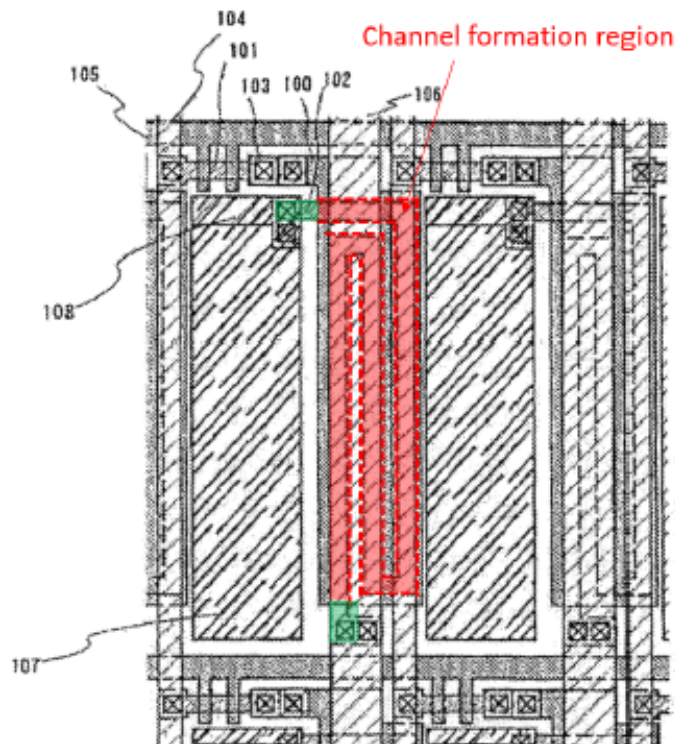


Figure 5 of the '049 Patent (Annotated by Patent Owner) is a diagram showing a top view of a pixel (Ex.1001, 10:4)

Prelim. Resp. 5. The annotated version of Figure 5 depicts a channel formation region in red that extends between a source region and a drain region of the TFT, which are depicted in green. Ex. 1001, 10:59–11:1,

11:20–23. According to the '049 patent, the pixel design depicted in Figure 5 has an increased channel region that reduces current dispersion and reduces variation in brightness of an OLED display. Ex. 1001, 11:25–27, 11:33–39.

D. The Challenged Claims

Petitioner challenges claims 1–6 of the '049 patent. Pet. 1, 5. Claim 1 is illustrative of the challenged claims and is reproduced below (bracketed numbering added to track the numbering added by Petitioner (Pet. 21)).

1. [1.pre] A light emitting device comprising:
 - [1.1] a semiconductor film including a channel formation region, a source region, and a drain region;
 - [1.2] a first insulating film over the semiconductor film,
 - [1.3] a gate electrode over the first insulating film;
 - [1.4] a second insulating film over the gate electrode;
 - [1.5] a power supply line over the second insulating film, the power supply line being electrically connected to one of the source region and the drain region;
 - [1.6] a source wiring over the second insulating film, the source wiring including a region overlapping with the semiconductor film; and
 - [1.7] a light-emitting element electrically connected to the other of the source region and the drain region,
 - [1.8] wherein a capacitance is formed in a region overlapping with the channel formation region by arranging the gate electrode, the second insulating film, and the power supply line in this order,
 - [1.9] wherein an end portion of the channel formation region includes a first point and a second point which overlap with the gate electrode, and
 - [1.10] wherein a length connecting the first point and the second point along a channel path is longer than a length

connecting the first point and the second point by a straight line.

E. Grounds

Petitioner asserts the following ground of unpatentability:

Claims Challenged	35 U.S.C. § ¹	Reference(s)
1–6	103	Kwon, ² Yamazaki ³

Pet. 14. Petitioner also cites the Declaration of Jerzy Kanicki, Ph.D. (Ex. 1002) in support of its contentions.

II. ANALYSIS

A. Level of Ordinary Skill

Petitioner contends a person of ordinary skill in the art at or around the time invention would have held “a graduate degree in electrical engineering or computer engineering or a similar discipline, with at least three years of relevant industry or research experience, including experience designing or implementing OLEDs in combination with pixel and/or driving circuits.” Pet. 31 (citing Ex. 1002 ¶ 82).

Patent Owner does not address a level of ordinary skill and does not contest Petitioner’s proposal. For the purposes of this Decision, we apply Petitioner’s definition of the person of ordinary skill.

¹ The application resulting in the ’049 patent claims priority to a date prior to when the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (2011), took effect. Thus, we refer to the pre-AIA versions of § 103.

² US 2002/0118150 A1, filed Dec. 7, 2001. Ex. 1003. The Petition and Preliminary Response refer to Kwon as “the ’150 publication.”

³ US 5,814,834, iss. Sept. 29, 1998. Ex. 1004. The Petition and Preliminary Response refer to Yamazaki as “the ’834 patent.”

B. Priority

The '049 patent identifies two applications as foreign application priority data: JP 2002-010766, filed January 18, 2002 (Ex. 1006, “the '766 application”) and JP 2001-344671, filed November 9, 2001 (Ex. 1005, “the '671 application”). Ex. 1001, code (30). Petitioner contends the claims of the '049 patent are not supported by the '671 application and therefore the '049 patent is not entitled to the November 9, 2001 priority date of the '671 application. Pet. 5–7. The '049 patent’s priority date is critical because November 9, 2001 predates Kwon’s December 7, 2001 filing date. *See* Pet. 7 (arguing Kwon qualifies as prior art under 35 U.S.C. § 102(e)).

“[A] patent application is entitled to the benefit of the filing date of an earlier filed application only if the disclosure of the earlier application provides support for the claims of the later application, as required by 35 U.S.C. § 112.” *In re Chu*, 66 F.3d 292, 297 (Fed. Cir. 1995). The earlier filed application provides support for the claims of the later application if the earlier application “reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). Petitioner contends the '671 application does not include support for the following limitation of claims 1 and 4: “wherein a capacitance is formed in a region overlapping with the channel formation region by arranging the gate electrode, the second insulating film, and the power supply line in this order” (the “capacitance limitations”). Pet. 6. According to Petitioner, support for the capacitance limitations was added for the first time in the '766 application. Pet. 6.

Patent Owner argues the '671 application includes support for each limitation of each claim, including the capacitance limitations. Prelim. Resp. 21–46 (mapping each limitation of claims 1–6 to the '671 application). For the capacitance limitations, Patent Owner argues the '671 application discloses structures arranged as claimed and that those structures inherently disclose the claimed capacitance. Prelim. Resp. 30 (“Fig. 5 of the '671 application, which shows ‘a pixel portion of a light-emitting device,’ provides inherent disclosure of [the capacitance limitations].”). Specifically, Patent Owner contends Figure 5 of the '671 application is identical to Figure 5 of the '049 patent and depicts a gate electrode and power supply line arranged as the conductive layers and a second insulating film arranged as the dielectric material, and the conductive layers and dielectric material form a capacitor. Prelim. Resp. 15, 30, 41–43. Further, Patent Owner contends that capacitors inherently disclose a capacitance (Prelim. Resp. 41–42) and thus “the capacitance that is formed in a region overlapping with the channel formation region by arranging the gate electrode, the second insulating material, and the power supply line in this order is an inherent property of the structures illustrated in Figure 5” (Prelim. Resp. 43).

Patent Owner correctly notes that Petitioner did not address Figure 5 of the '671 application. Prelim. Resp. 19–21. Petitioner did, however, address Figure 5 of the '049 patent, providing the annotated version reproduced below.

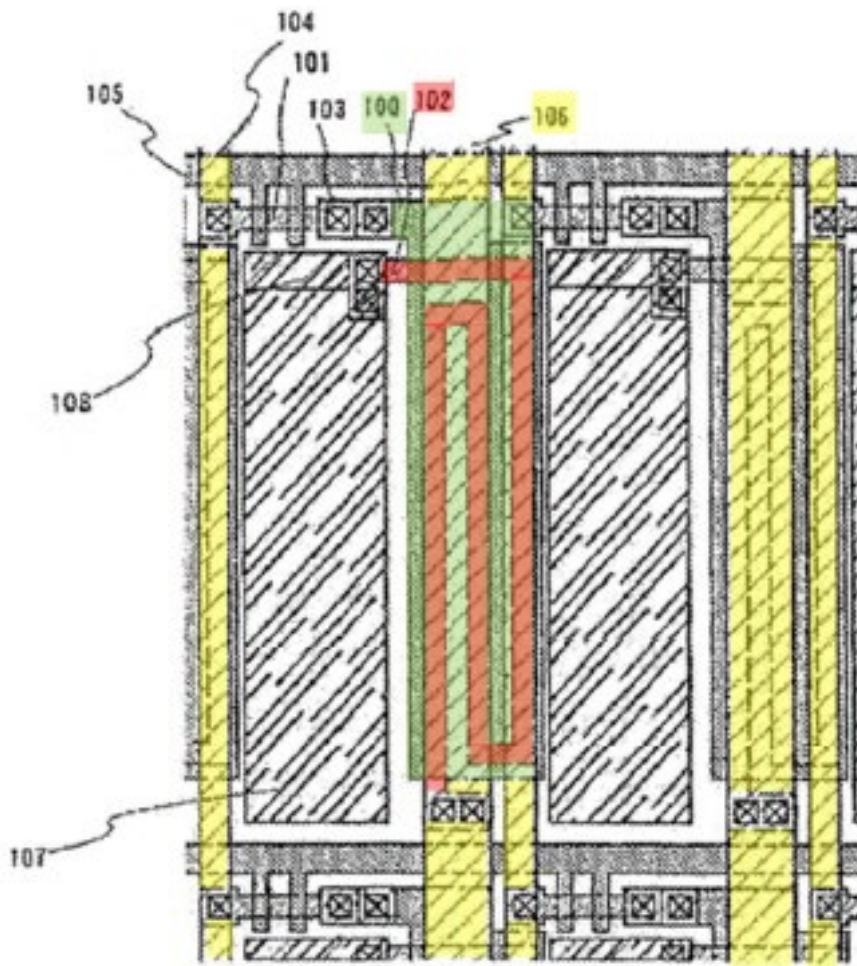


Figure 5 of the '049 Patent (Annotations by Petitioner) is a diagram showing a top view of a pixel (Ex. 1001, 10:4)

Pet. 25. Petitioner's annotated version of Figure 5 depicts the top view of a pixel having power supply line 106 highlighted in yellow, gate electrode 100 highlighted in green, and semiconductor layer 102 highlighted in pink.

Pet. 24; *see* Ex. 1001, 10:47–11:16 (describing Figure 5). Notably, Petitioner and Dr. Kanicki characterize the pixel design disclosed in the '049 patent as a “very basic design.” Pet. 17; Ex. 1002 ¶ 40.

Figure 5 of the '671 application, copied below, depicts a pixel having the same structures and design.

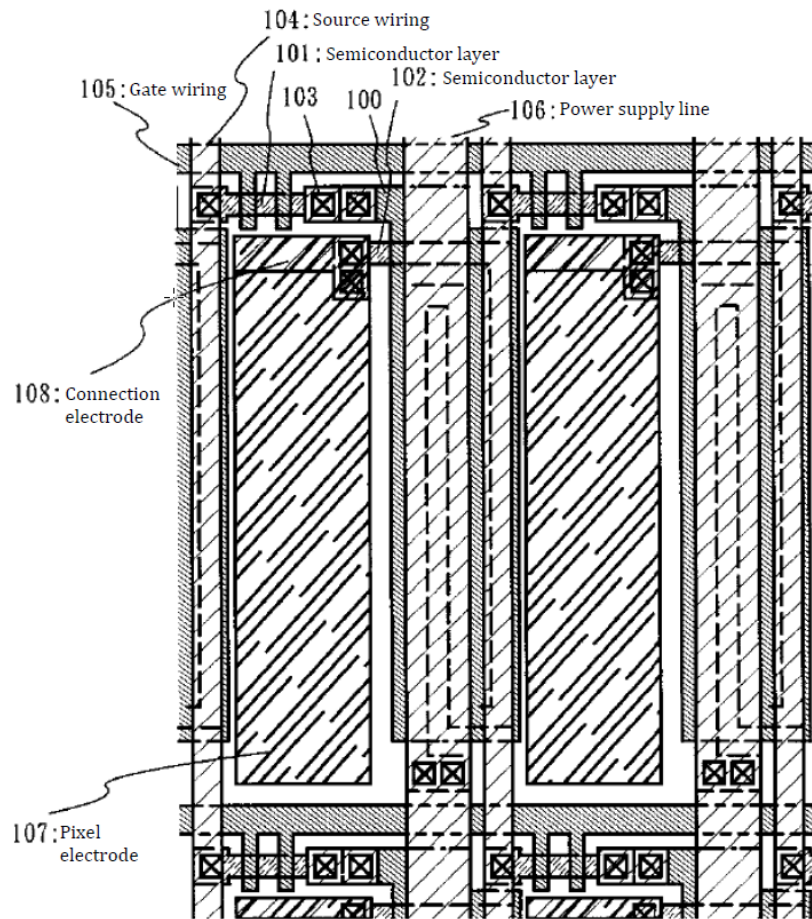


Figure 5 of the '671 Application is a diagram of a top view of a pixel (Ex. 1005 ¶ 44)

Like Figure 5 of the '049 patent, Figure 5 of the '671 application depicts the top view of a pixel having power supply line 106, semiconductor layer 102, and gate electrode 100. Ex. 1005 ¶¶ 45, 46.

We are persuaded that Figure 5 of the '671 application depicts the same structures as those depicted and described in Figure 5 of the '049 patent. Petitioner contends a person of ordinary skill in the art would have had a graduate degree in electrical or computer engineering and at least three years designing and implementing OLEDs in combination with pixel and/or

driving circuits. Pet. 31. We are persuaded Figure 5 of the '671 application and related descriptions reasonable convey to those skilled in the art that the inventors had possession of the claimed capacitance limitations. Further, we are persuaded by Patent Owner's citations to the '671 application (Prelim. Resp. 32–38) that the inventors had possession of the inventions of claims 1–6 of the '049 patent as of the '671 application's filing date. Accordingly, we are persuaded that the '049 patent can claim priority to the November 9, 2001 filing date of the '671 patent and that Kwon therefore does not constitute prior art to the '049 patent. *See Dynamic Drinkware, LLC v. National Graphics, Inc.*, 800 F.3d 1375, 1379–80 (Fed. Cir. 2015) (describing the parties' burdens of production in an *inter partes* review involving a priority dispute).

For this reason, Petitioner has not demonstrated that it is reasonably likely to show that claims 1–6 would have been obvious over Kwon and Yamazaki.

C. Rationale to Combine

Even if Kwon were prior art to the '049 patent, we determine Petitioner has not presented an adequate rationale to combine Kwon and Yamazaki to arrive at the claimed invention. Among other things, Petitioner argues “[a] person of ordinary skill would have been motivated to replace the channel formation region of [Kwon] with the channel formation region of [Yamazaki] to solve the TFT threshold voltage variation issue identified in [Kwon].” Pet. 38 (citing Ex. 1002 ¶ 114). Further, Petitioner asserts that OLED current can be reduced by increasing the channel length of the TFT such that a person of ordinary skill would have been motivated to use a TFT with a larger channel length as taught by Yamazaki. Pet. 36–37. But we

agree with Patent Owner that the '049 patent itself suggests that relationship, not Kwon or Yamazaki, and that Petitioner's suggested motivation to combine Kwon and Yamazaki is guided by improper hindsight. *See* Prelim. Resp. 52–53. Petitioner's reliance on the Kanicki Declaration is misplaced, as Dr. Kanicki's testimony is conclusory and does not state the basis for that testimony. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

We also agree with Patent Owner that Petitioner failed to establish that a person of ordinary skill would have had a reasonable expectation of success in combining the references. Prelim. Resp. 54–59 (citing *Samsung Elecs. Co. v. Elm 3DS Innovations, LLC*, 925 F.3d 1373 (Fed. Cir. 2019) among other cases). We agree with Patent Owner that the semiconductor technology at issue in this proceeding is complex and that a skilled artisan's expectation of success should have been explained and supported by evidence. Prelim. Resp. 55; *see also* *Samsung*, 925 F.3d at 1382–83 (affirming the Board, which “repeatedly stated that integrated-circuit technology is complex and, as such, looked for specific evidence that a person of ordinary skill in the art would have reasonably expected success in combining [prior art fabrication process and dielectric material]”). Petitioner and Dr. Kanicki are silent as to whether a skilled artisan would have had a reasonable expectation of success and we do not see evidence presented by Petitioner from which we would infer that a skilled artisan would have had that expectation. Accordingly, we determine Petitioner has not presented adequate reasons for combining Kwon and Yamasaki.

For these additional reasons, Petitioner has not demonstrated that it is reasonably likely to show that claims 1–6 would have been obvious over Kwon and Yamazaki.

D. Discretionary Denial

Because we deny the Petition on the merits, we do not reach the issues of discretionary denial. *See* Pet. 74–75; Prelim. Resp. 60–66.

III. CONCLUSION

For the foregoing reasons, we are not persuaded that the Petition establishes a reasonable likelihood that Petitioner would prevail in any of its challenges to claims 1–6 of the '049 patent.

IV. ORDER

In consideration of the foregoing, it is hereby ordered that the Petition is *denied*, and no trial is instituted.

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