

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MISAKO NAKAZAWA, KENJI KASAHARA, and HISASHI OHTANI

Appeal 2008-0242
Application 10/337,725¹
Technology Center 2800

Decided: March 6, 2008

Before KENNETH HAIRSTON, SCOTT BOALICK, and MARC S. HOFF,
Administrative Patent Judges.

HOFF, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF CASE

Appellants appeal under 35 U.S.C. § 134 from a Final Rejection of claims 9-17. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

Appellants' invention relates to a crystalline semiconductor film in which the locations and sizes of crystal grains have been controlled and a

¹ Application filed January 8, 2003. The real party in interest is Semiconductor Energy Laboratory Co., Ltd.

thin film transistor (TFT) capable of high speed operation by employing the crystalline semiconductor film as the channel forming region of the TFT (Specification 7). A semiconductor device according to the invention includes a substrate having light transmissivity; a subbing insulating film formed over the substrate; an organic resin film which lies in touch with the subbing insulating film; an inorganic insulating film which covers said organic resin film; and a crystalline semiconductor film which lies in touch with said inorganic insulating film (Specification 7-8).

Claim 9 is exemplary:

A semiconductor device comprising:
a substrate;
an insulating film provided over said substrate;
an organic resin film provided over said insulation film;
an inorganic insulating film provided over said organic resin film; and
a semiconductor film provided over said inorganic insulating film.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Rho	6,057,896	May 2, 2000
Kemmochi	6,136,624	Oct. 24, 2000

Claims 9-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Rho in view of Kemmochi.

Appellants contend that the Examiner erred in his rejection because the skilled artisan would not have been motivated to modify Rho in the manner suggested by Kemmochi. The Examiner contends that the combined teachings of the references fairly suggest the combination.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the Briefs and the Answer for their respective details.

ISSUE

The principal issue in the appeal before us is whether the Examiner erred in holding that the person having ordinary skill in the art would have been motivated to modify the semiconductor structure of Rho to interpose an interlayer insulating layer between the substrate and organic insulating layer, as taught by Kemmochi, for the purpose of preventing moisture from infiltrating, given that in Kemmochi the semiconductor layer is positioned *beneath* the interlayer insulating layer, whereas in Rho the semiconductor layer is positioned *above* the location the Examiner suggests that the interlayer insulating layer be placed.

FINDINGS OF FACT

The following Findings of Fact (FF) are shown by a preponderance of the evidence.

The Invention

1. According to Appellants, they have invented a semiconductor device structure including a substrate having light transmissivity; a subbing insulating film formed over the substrate; an organic resin film which lies in touch with the subbing insulating film; an inorganic insulating film which covers said organic resin film; and a crystalline semiconductor film which lies in touch with said inorganic insulating film (Specification 7-8).

Rho

2. Rho teaches a thin film transistor liquid crystal display whose black matrix is formed on a thin film transistor substrate (col. 1, ll. 12-13).

3. The liquid crystal display includes a passivation layer made of a flowable organic insulating material, coated on a substrate having a gate electrode (col. 3, ll. 11-13).

4. An (inorganic) silicon nitride layer is deposited on the flowable insulating layer (col. 3, ll. 13-14).

5. A semiconductor layer is formed on the silicon nitride layer, and the silicon nitride layer is etched away except the portion under the semiconductor layer (col. 3, ll. 14-16).

Kemmochi

6. Kemmochi teaches an array substrate, liquid crystal display device and their manufacturing method (col. 1, ll. 6-7). The array substrate comprises a first conductive layer stacked on a substrate, a first (inorganic) inter-layer insulating film, and a second (organic) inter-layer insulating film stacked on the first inter-layer insulating film (col. 2, ll. 42-60).

7. “[B]y stacking the inorganic material film having a large passivation effect as the first inter-layer insulating film, infiltration of moisture, or the like, can be prevented, and a semiconductor device using such a film promises a long-run reliability” (col. 4, ll. 22-26).

PRINCIPLES OF LAW

In rejecting claims under 35 U.S.C. § 103, the Examiner bears the

initial burden of establishing a prima facie case of obviousness. *In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984). The Examiner can satisfy this burden by showing some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *KSR Int'l. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007) (*citing In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Appellant. *Piasecki*, 745 F.2d at 1472. Thus, the Examiner must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the Examiner's conclusion.

The determination of obviousness must consider, *inter alia*, whether a person of ordinary skill in the art would have been motivated to combine the prior art to achieve the claimed invention and whether there would have been a reasonable expectation of success in doing so. *Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.*, 229 F.3d 1120, 1124 (Fed. Cir. 2000). *Medichem S.A. v. Rolabo S.L.*, 437 F.3d 1157, 1164 (Fed. Cir. 2006). Where the teachings of two or more prior art references conflict, the Examiner must weigh the power of each reference to suggest solutions to one of ordinary skill in the art, considering the degree to which one reference might accurately discredit another. *In re Young*, 927 F.2d 588, 591 (Fed. Cir. 1991). If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984). Further, our reviewing court has held

that “[a] reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994); *Para-Ordnance Mfg. v. SGS Importers Int’l*, 73 F.3d 1085, 1090 (Fed. Cir. 1995).

ANALYSIS

Appellants argue that the Examiner failed to establish a *prima facie* case of obviousness in his rejection of claims 9-17 over Rho in view of Kemmochi. Specifically, Appellants assert that the Examiner’s proposed modification of Rho to include an insulating layer as taught by Kemmochi, between the substrate (10) and flowable organic insulating layer (41) of Rho, lacks motivation. Appellants concede that the insulating layer of Kemmochi serves to prevent moisture from ‘infiltrating’ down to the semiconductor layer of Kemmochi, which lies below the insulating layer (Reply Br. 5). The semiconductor layer of Rho, however, is situated *above* the location of the proposed modification, such that (in Appellants’ view) the insulating layer of Kemmochi would have been ineffective to prevent moisture from reaching the semiconductor layer of Rho (Reply Br. 6).

The Examiner argues that one of ordinary skill in the art would have been motivated to combine the references because including an inorganic insulating layer below the organic layer of Rho prevents infiltration of moisture (Ans. 6; see FF 7). It is the Examiner’s position that the location of the semiconductor layer in Rho *above* the location of the proposed modification, as contrasted with Kemmochi where the semiconductor layer

is *beneath* the inorganic layer in question, is not relevant to the instant rejection because Kemmochi simply teaches the prevention of infiltration of moisture (Ans. 6-7).

We disagree with the Examiner. The Examiner concedes that Rho does not explicitly disclose an additional insulating layer provided between the substrate and the organic resin film (Ans. 4). Kemmochi is cited for the specific purpose of showing that modifying Rho to include such a layer would have been obvious. Kemmochi is directed to the composition of a liquid crystal display device, which operates to display information because of the presence of *semiconductor devices* (see col. 1, ll. 13-27). Insulating layers are included in Kemmochi's LCD device because they serve some purpose related to ensuring proper operation of the semiconductor devices (see, e.g., col. 1, l. 61 to col. 2, l. 8). The passage cited by the Examiner as supplying motivation to make the combination states that "by stacking an inorganic material film having a large passivation effect as the first inter-layer insulating film, infiltration of moisture, or the like, can be prevented, and *a semiconductor device using such a film promises a long-run reliability*" (emphasis added; FF 7).

Given that the Examiner has not pointed to a teaching that infiltration of moisture from the substrate of Rho upward, toward the semiconductor layer, is a problem, we find that the modification of Rho to include the insulating layer of Kemmochi below Rho's semiconductor layer, as proposed by the Examiner, would have been ineffective to prevent infiltration of moisture onto the semiconductor layer of Rho. As a result, we find that the skilled artisan would not have been motivated to modify Rho to

include the insulating layer of Kemmochi in the manner advanced by the Examiner.

We therefore conclude that the Examiner erred in holding that it would have been obvious to modify Rho in view of Kemmochi in order to arrive at the claimed invention. As a result, we reverse the rejection of claims 9-17.

OTHER ISSUES

We observe that at page 3 of the Brief, Appellants “continue to request examination of what is believed to be generic claim 1. If the restriction of claims 1 and 27-60 is maintained, the appellants respectfully submit that any of one or more divisional applications based on claims 1 and 27-60 should not be subject to a double patenting rejection.” We remind Appellants that relief from adverse restriction requirements may be obtained via petition to the Group Director (MPEP 1201; 37 CFR § 1.144), rather than from the Board of Patent Appeals and Interferences². We therefore take no action with regard to Appellants’ request.

CONCLUSION OF LAW

We conclude that Appellants have shown that the Examiner erred in rejecting claims 9-17. On the record before us, Claims 9-17 have not been shown to be unpatentable.

² We further note that petition from restriction requirements must be filed not later than appeal (37 CFR § 1.144) and that in any event, any petition not filed within 2 months from the action complained of may be dismissed as untimely (37 CFR § 1.181).

Appeal 2008-0242
Application 10/337,725

DECISION

The Examiner's rejection of claims 9-17 is reversed.

REVERSED

gvw

Eric Robinson
PMB 955
21010 Southbank St.
Potomac Falls, VA 20165