

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 35

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TOSHIHIKO MANO, TOSHIMOTO KODAIRA and HIROYUKI OSHIMA

Appeal No. 1998-1993
Application 08/320,729

HEARD: November 15, 2000

Before THOMAS, HAIRSTON, and JERRY SMITH, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 44-51 and 53, which constitute all the claims remaining in the application.

The disclosed invention pertains to a liquid crystal

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display device wherein data signals are supplied to the liquid crystal cells through a plurality of field effect transistors arranged in a plurality of picture elements. The invention is primarily directed to details of the field effect transistors.

Representative claim 44 is reproduced as follows:

44. A liquid crystal device wherein data signals are supplied to liquid crystal cells through a plurality of field effect transistors arranged in a plurality of picture elements, each of said field effect transistors comprising:

a channel region comprising a thin film of silicon;

a gate insulating film in contact with the channel region; and

a gate electrode in contact with the gate insulating film and opposing the channel region, wherein a leakage current of the field effect transistor in the OFF state is dependent on the thickness of the channel region, and the channel region has a thickness less than 2500Å so that when the field effect transistor is in the OFF state, the leakage current flowing through the field effect transistor is less than 1/10 of the leakage current flowing through a corresponding liquid crystal cell based on a resistance of the liquid crystal cells and an area of the picture elements.

The examiner relies on the following references:

Asars et al. (Asars)	4,112,333	Sep. 05, 1978
Morozumi	4,582,395	Apr. 15, 1986
Mano et al. (Mano)	5,124,768	June 23, 1992
Holmberg et al. (Holmberg) (UK Patent Application)	2,067,353	July 22, 1981
Togashi	2,070,857	Sep. 09, 1981

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(UK Patent Application)

The following rejections are on appeal before us:

1. Claims 44-51 and 53 stand rejected as unpatentable under the judicially established doctrine of obviousness-type double patenting over the claims of Mano.

2. Claim 53 stands rejected as unpatentable under the judicially established doctrine of obviousness-type double patenting over the claims of Mano considered further with Holmberg.

3. Claims 44-49 and 51 stand rejected under 35 U.S.C. § 103 as being unpatentable over the teachings of Morozumi considered with Togashi and Asars.

4. Claims 50 and 53 stand rejected under 35 U.S.C. § 103 as being unpatentable over the teachings of Morozumi considered with Togashi and Asars, and considered further with Holmberg.

Rather than repeat the arguments of appellants or the

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examiner, we make reference to the briefs and the answer for the respective details thereof.

OPINION

We have carefully considered the subject matter on appeal, the rejections advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellants' arguments set forth in the briefs along with the examiner's rationale in support of the rejections and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the examiner has failed to establish a case of obviousness-type double patenting of the appealed claims. We are also of the view that the evidence relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 44-51 and 53. Accordingly, we reverse.

We consider first the rejection of claims 44-51 and 53

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based on the grounds of double patenting. Although the examiner has nominally designated this rejection as being based on the judicially created doctrine of obviousness-type double patenting, the examiner has made no obviousness determinations of the appealed claims with respect to the claims of Mano. Instead, the examiner has asserted that obviousness determinations did not have to be considered because, in the examiner's view, these appealed claims fall within the ambit of In re Schneller, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). Based on the examiner's interpretation of Schneller, the examiner finds that appealed claims 44-51 and 53 of this application cover subject matter "already adequately claimed and covered in [Mano]" [answer, page 6].

Appellants do not discuss the application of Schneller to the facts of this case. Instead, appellants simply argue that the appealed claims are not unpatentable under the doctrine of obviousness-type double patenting because neither claims 1-17 of Mano nor the teachings of Morozumi, Asars, Togashi and/or Holmberg disclose or suggest the subject matter specifically recited in independent claim 44 [brief, page 11].

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The rejection of claims on obviousness-type double patenting based on the decision in Schneller has recently found favor with patent examiners. The Board of Patent Appeals and Interferences has recently published a decision which discusses in detail the "cover" test of Schneller and its applicability to obviousness-type double patenting rejections. See ex parte Davis, 56 USPQ2d 1434 (BPAI 2000). We adopt the reasoning of the panel in Davis in deciding this appeal. To put it briefly, the "cover" test of Schneller should be interpreted as a test to determine whether the claims of an application and the claims of a patent are patentably distinct. Thus, in considering the obviousness-type double patenting rejection before us on this appeal, the appropriate question is whether claims 44-51 and 53 of this application are patentably distinct from the claims of Mano.

Claims 44-51 and 53 recite limitations which do not appear in the claims of the Mano patent. As noted above, the examiner has made no determinations regarding the obviousness of these limitations which do not appear in the claims of the patent. In making a prima facie case of obviousness-type

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double patenting, an examiner has the same burden as when an obviousness rejection under 35 U.S.C. § 103 is made. Thus, at a minimum the examiner is required to identify the differences between the applications claims and the claims of the patent and to provide a reason why these differences would have resulted from an obvious modification to the claims of the patent. The examiner's failure to address the differences between the appealed claims and the claims of the Mano patent, and the examiner's failure to address the obviousness of these differences result in a failure by the examiner to establish a prima facie case of unpatentability. Therefore, we do not sustain any of the examiner's rejections of claims 44-51 and 53 based on obviousness-type double patenting.

We now consider the rejection of the claims under 35 U.S.C. § 103. In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In

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so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with

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argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. See Id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976). Only those arguments actually made by appellants have been considered in this decision. Arguments which appellants could have made but chose not to make in the brief have not been considered [see 37 CFR § 1.192(a)].

We consider first the rejection of claims 44-49 and 51 based on the teachings of Morozumi, Togashi and Asars. These claims stand or fall together as a single group [brief, page 3]. With respect to representative, independent claim 44, the examiner points to Morozumi as teaching a transistor of the type claimed in which it is desired to minimize leakage current. Specifically, Figure 10 of Morozumi teaches the relationship between transistor leakage current and the thickness of the channel region. The lowest leakage current

shown in Morozumi's Figure 10 is about 0.05×10^{-9} amperes corresponding to a channel thickness of about 1250 D. Morozumi discloses that thin film transistors having leakage currents of 100 picoamperes (0.1×10^{-9} amperes) or less were possible [column 11, lines 46-48]. Thus, the examiner found that Morozumi suggested low leakage liquid crystal devices in which the transistors had a channel thickness of about 1250 D and a leakage current of about 5×10^{-11} amperes. The examiner cites Asars as teaching a low leakage liquid crystal device. Asars discloses that such a device has a leakage resistance equal to or greater than 10^{10} ohms [column 5, lines 12-13]. Based on the teachings of Morozumi and Asars, the examiner finds that the low leakage liquid crystal device of Morozumi should have a leakage resistance of 10^{10} ohms or more as taught by Asars. The examiner notes that the low leakage liquid crystal devices of Morozumi and Asars disclose nothing about the size of such devices. The examiner notes that in making the low leakage liquid crystal device of Morozumi and Asars, the artisan would begin by considering liquid crystal cells which had a size that was typical at the time of Morozumi and

Asars. The examiner cites Togashi which teaches a typical liquid crystal display panel in which each cell is a square of about 0.04 square mm. Thus, the examiner finds that in making a low leakage liquid crystal device, the artisan would have used channel thicknesses, leakage currents and leakage resistances as taught by Morozumi and Asars with cells designed of a typical size as taught by Togashi. The examiner concludes that a low leakage liquid crystal device designed with the teachings of Morozumi, Asars and Togashi would inherently have the 1/10 leakage current property recited in claim 44 [answer, pages 7-9].

Appellants argue that the examiner is improperly picking and choosing leakage resistance and cell size without proper motivation. They assert that none of the references discloses or suggests the advantage of using particular values of resistance and cell size. Thus, appellants argue that the examiner has used improper hindsight gleaned from appellants' own specification in combining the teachings of Morozumi, Asars and Togashi. Appellants also assert that the fact that the combined teachings of the applied references may

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inherently perform like the claimed invention is not a substitute for a teaching or suggestion supporting an obviousness rejection [brief, pages 7-10; reply brief, pages 1-3].

The examiner's combination of Morozumi, Asars and Togashi is fundamentally based on the examiner's view that these three references simply represent three conventional teachings of a low leakage current thin-film transistor. That is, the examiner asserts that there is nothing remarkable about his selection of the three applied references because they are evidence of what was conventional in this art. We would agree with the examiner that a legitimate case for obviousness could be made in theory if the three applied references related to conventional features of the same or similar transistors. However, we are unable to draw that conclusion.

The artisan would have appreciated that the operating characteristics of a transistor are a function of many

variables such as operating voltages, device sizes, and the materials used in the manufacture of the devices. It is our view that in order for several different references to be cited as conventional features of a transistor, the transistors of the several references should all have similar operating ranges, device sizes and device materials. In other words, a conventional feature of a transistor operating under one condition would not necessarily be a conventional feature of a different transistor operating under different conditions.

Of particular concern to us is the difference in the range of voltages in which Morozumi, Asars and Togashi are designed to operate and the differences in the semiconductor channel materials. Morozumi describes a liquid crystal device operating at about 10 volts [column 8, lines 26-43; column 11, line 48]. Asars describes a liquid crystal device operating at about 80 volts [column 5, lines 10-12]. Togashi describes a liquid crystal device operating at about 40 volts [page 3, line 113]. Thus, the first thing we note is that the liquid crystal devices of Morozumi, Asars and Togashi are designed to

operate at substantially different voltage levels.

Morozumi, like the claimed invention, has a channel region comprised of a thin film of silicon [column 2, lines 1-8]. The channel region in Asars is comprised of cadmium selenide [column 3, lines 28-30]. Togashi discloses transistors having a channel region comprised of a thin film of cadmium selenide or an amorphous form of silicon. Therefore, once again, the alleged conventional properties of these devices relate to devices which are not all formed of the same material.

When the differences between the liquid crystal devices of Morozumi, Asars and Togashi are considered, we are constrained to find that these three references are not directed to the same liquid crystal device. Therefore, what the examiner finds as conventional in one of these references does not make it conventional when modified to meet the different operating characteristics of the other liquid crystal devices. Since the liquid crystal devices of these three references are not the same, the "conventional" teachings of one reference cannot simply be substituted into

the device of one of the other references. Thus, one of ordinary skill in the art would not have been motivated to simply combine features of the different liquid crystal devices of the applied prior art. Therefore, we agree with appellants that the particular citation of Morozumi, Asars and Togashi in the rejection before us results from an improper attempt by the examiner to reconstruct the invention in hindsight. Accordingly, we do not sustain the rejection of claims 44-49 and 51 based on the collective teachings of Morozumi, Asars and Togashi.

We now consider the rejection of claims 50 and 53 based on the teachings of Morozumi, Togashi, Asars and Holmberg. Morozumi, Togashi and Asars are applied as discussed above. The examiner cites Holmberg as teaching another low leakage liquid crystal device in which the channel thickness ranges from 100 D to 5000 D with approximately 1000 D being one example. The examiner notes that Holmberg also teaches a ratio of drain current in the ON state to drain current in the OFF state to be about 10^7 . The examiner finds that the liquid crystal device of Morozumi, Asars and Togashi with a channel

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thickness of about 1000 D would inherently have an ON/OFF ratio similar to the ratio of 10^7 as disclosed by Holmberg [answer, page 9].

Appellants argue that Holmberg does not remedy the deficiencies in the prior art as discussed above with respect to claim 44. We agree. Since Holmberg does not overcome the deficiencies in the basic combination of references discussed above, we also do not sustain the rejection of claims 50 and 53 based on the applied prior art.

In summary, we have not sustained any of the examiner's

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rejections of the appealed claims. Therefore, the decision of
the examiner rejecting claims 44-51 and 53 is reversed.

REVERSED

JAMES D. THOMAS)	
Administrative Patent Judge)	
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)	
)	BOARD OF PATENT
KENNETH W. HAIRSTON))
Administrative Patent Judge)	APPEALS AND
)	
)	INTERFERENCES
)	
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