

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 69

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RICHARD A. FLASCK

Appeal No. 1998-0495
Application No. 08/324,540

HEARD: October 25, 2000

Before BARRETT, DIXON, and GROSS, Administrative Patent Judges.
GROSS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 8, 10 through 12, 14 through 18, 21, 24 through 28, 30 through 36, and 39 through 44, which are all of the claims pending in this application.

Appellant's invention relates to a reflective, wafer based, active matrix, polymer dispersed liquid crystal (hereafter, PDLC) display used for projection. Claim 42 is illustrative of the claimed invention, and it reads as follows:

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42. A wafer based active matrix, said matrix comprising:

a single crystal semiconductor wafer;

an active matrix formed on said wafer including a plurality of specular reflective electrodes for forming a reflected light beam from light directed thereto and for imparting information onto said reflected light beam;

a liquid crystal-type material formed onto said active matrix, said liquid crystal-type material comprised of a polymer matrix having a plurality of liquid crystal droplets suspended therein and having an orientation which can be activated and oriented by an electric field applied thereto, whereby said wafer based active matrix can be used in a projection display system to display images therewith.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Soref 1974	3,807,831	Apr. 30,
Lloyd 1980	4,239,346	Dec. 16,
Yamazaki 1984	4,470,060	Sep. 04,
Doane et al. (Doane) 1987	4,688,900	Aug. 25,
Erb 1988	4,745,454	May 17,
Castleberry 1989	4,804,953	Feb. 14,
Yokoi et al. (Yokoi) 1989	4,818,074	Apr. 04,
Kikuchi et al. (Kikuchi) 13, 1990	4,908,692	Mar.

(filed Jan. 27, 1989)

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Claims 8, 10 through 12, 14 through 18, 21, 24 through 28, 30 through 36, 39 through 41, 43, and 44 stand rejected under 35 U.S.C. § 103 as being unpatentable. As evidence of obviousness, the examiner applies Lloyd, Yamazaki, Doane, and Yokoi against all of the claims, with the addition of Erb for claims 8 and 25, Kikuchi for claims 12 and 28, Castleberry for claims 14 through 16 and 30 through 32, and Soref for claims 39 and 41.¹

Claim 42 stands rejected under 35 U.S.C. § 103 as being unpatentable over Lloyd in view of Doane and Yokoi.

Reference is made to the Examiner's Answer (Paper No. 60, mailed June 9, 1997) for the examiner's complete reasoning in support of the rejections, and to appellant's Brief (Paper No. 59, filed March 18, 1997) for appellant's arguments thereagainst.

OPINION

We have carefully considered the claims, the applied prior art references, and the respective positions articulated by appellant and the examiner. As a consequence of our

¹ We note that on page 10 of the Answer, the examiner withdraws the rejection of claims 36, 43, and 44 under 35 U.S.C. § 112, second paragraph.

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review, we will affirm the obviousness rejections of claims 42 and 43 and reverse the obviousness rejections of claims 8, 10 through 12, 14 through 18, 21, 24 through 28, 30 through 36, 39 through 41, and 44.

Regarding the rejection of claim 42, appellant contends (Brief, page 11) that the references do not teach how to substitute PDLC for the liquid crystal material of Lloyd since they function differently. However, Lloyd discloses (column 1, lines 18-24) that in the absence of an applied potential, the liquid crystal material is clear, and the reflective cell appears black, whereas in the presence of an electric potential, the liquid crystal scatters light, and the cell appears white. Doane teaches (column 2, line 61-column 3, line 1) that PDLC scatters light when no electric field is applied, thereby appearing white, and transmits light when an electric field is applied. Further, Doane explains (column 12, lines 50-52) that a reflective background improves the on-off visual contrast. (With a reflector, the display will appear black when the electric field is applied.) Thus, the two visual states are the same as for the liquid crystal of Lloyd, except that a PDLC's white state appears in the absence

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of an applied field whereas the other liquid crystal's white state appears with an electric field.

In addition, Lloyd states (column 7, lines 2-8) that the cell may be slightly modified for utilization of twisted nematic liquid crystal. Thus, Lloyd implies that the skilled artisan would know that slight variations may be necessary to employ a different type of liquid crystal and that such an artisan would know how to modify the cell to accommodate the alternative material. Furthermore, Doane discusses (column 1 and column 2, lines 7-16) all of the benefits of PDLC, including uniformity in cell thickness, simplicity of preparation and cell fabrication, improved brightness since polarizers are not required, and improved responsive features. Accordingly, we agree with the examiner that it would have been obvious to one skilled in the art to substitute PDLC for the liquid crystal of Lloyd.

Appellant further asserts (Brief, page 12) that it was previously thought that the voltages available with a wafer based active matrix were not high enough for PDLC. However, the claims are directed to a device, not a driving method. For such a device, Doane suggests the obviousness of using

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PDLC, regardless of the driving structure. Also, appellant has not disclosed any new wafer, new PDLC, or new way of implementing the PDLC to overcome any problems with the voltages. Therefore, we find appellant's argument unpersuasive.

Next appellant essentially argues (Brief, page 14) that Doane only discloses using PDLC for thermally responsive applications and therefore does not suggest the claimed application for PDLC. Appellant apparently has overlooked all of Doane's references to use as an electrically responsive material, such as in the last paragraph beginning in each of columns 2 and 3. In fact, in column 4, lines 9-29, Doane suggests that PDLC has a fast switching time, and in column 5, lines 10-12, Doane states that PDLC has a field-alignment phenomenon which allows it to be used as a switchable light polarizer when used as an electrically responsive material. Although Doane does not specify projection as an application for PDLC, the skilled artisan would expect the listed benefits to be equally applicable to projectors. One cannot forget that the standard under

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35 U.S.C. § 103 is what would have been obvious to one of ordinary skill in the art, and the level of the skilled artisan should not be underestimated. See In re Sovish, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985).

Appellant further contends (Brief, page 15) that Yokoi merely teaches using a liquid crystal, and not PDLC, for a projection device, and therefore is irrelevant to the claimed invention. However, Yokoi (column 1, lines 24-35) discusses the problem of decreased light transmission in projectors which use twisted nematic liquid crystal with two polarizers. As explained above, Doane teaches that PDLC should be used to eliminate the need for polarizers and thus brighten the display. In other words, the combined teachings of Yokoi and Doane would suggest to one skilled in the art that PDLC is ideal for use in a projector such as Yokoi's. Accordingly, we will sustain the obviousness rejection of claim 42 over Lloyd, Doane, and Yokoi.

The examiner rejects claim 43 over Lloyd, Doane, and Yokoi, as applied to claim 42, and further in view of Yamazaki, although the only limitation in claim 43 that is not present in claim 42 is the description of how the PDLC

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material is known (as explained in Doane) to function. Therefore, we find Yamazaki to be merely cumulative. Since we have affirmed the rejection of claim 42, we likewise will sustain the rejection of claim 43.

Claims 8, 10 through 12, 14 through 18, 21, 24 through 28, 30 through 36, 40, and 44 all recite that each pixel electrode "is formed over an intersection of the bit and word lines." The examiner relies on Yamazaki's Figures 15, 18, and 22 as illustrating pixel electrodes each formed over an intersection of a data line and a gate line. The examiner states (Answer, pages 4, 7, and 11) that the motivation for using such a structure is to improve the size and the quality of the display.

For a rejection under 35 U.S.C. § 103, the examiner is required to provide a reason from some teaching, suggestion or implication in the prior art as a whole, or knowledge generally available to one of ordinary skill in the art, why one having ordinary skill in the pertinent art would have been led to modify the prior art to arrive at the claimed invention. Uniroyal, Inc. v. Rudkin-Wiley, 837 F.2d 1044, 1052, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988), cert. denied, 488

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U.S. 825 (1988). 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).

Furthermore, "[o]bviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor." Para-Ordnance Mfg., Inc. v. SGS Importers Int'l, Inc., 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995), citing W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1551, 1553, 220 USPQ 303, 311, 312-13 (Fed. Cir. 1983).

We find no disclosure or suggestion in Yamazaki or any of the other applied references of the examiner's stated motivation, and the examiner has pointed to none. The only place we find such reasoning appears in appellant's own specification at page 8, for example. Although the examiner adds Erb, Kikuchi, and Castleberry in rejecting claims 8 and 25, claims 12 and 28, and claims 14 through 16 and 30 through 32, respectively, none of the additional references cures the deficiencies of the primary combination of Lloyd, Doane, Yokoi, and Yamazaki. Accordingly, the examiner has failed to

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establish a prima facie case of obviousness for all of claims 8, 10 through 12, 14 through 18, 21, 24 through 28, 30 through 36, 40, and 44.

Instead of requiring each pixel electrode to be formed over the intersection of the bit and word lines, claims 39 and 41 recite that the common electrode is formed substantially in the same plane as the pixel electrodes. The examiner adds Soref to the primary combination of references as an example of the additional limitation. The examiner's reason for modifying Lloyd to include such a structure is (Answer, page 8) "because this is a conventional way to form a common electrode in an LCD." However, the mere existence of such a structure in a single reference hardly suffices for a showing of conventionality. Further, the examiner has pointed to no teaching or suggestion in any of the references which would indicate the desirability of forming the common electrode in the same plane as the pixel electrodes. Consequently, the examiner again has failed to establish a prima facie case of obviousness, and we cannot sustain the rejection of claims 39 and 41.

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CONCLUSION

We have affirmed the examiner's rejection of claims 42 and 43 under 35 U.S.C. § 103, and reversed the examiner's rejection of claims 8, 10 through 12, 14 through 18, 21, 24 through 28, 30 through 36, 39 through 41, and 44 under 35 U.S.C. § 103. Accordingly, the decision of the examiner rejecting the claims is affirmed-in-part.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

LEE E. BARRETT)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
JOSEPH L. DIXON)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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ANITA PELLMAN GROSS)	
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