

The opinion in support of the decision being entered today is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JIUZHI XUE, BETH L. ELLIS, STEPHEN H. PERLMUTTER,  
and CHARLES CRANDALL

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Appeal 2007-1304  
Application 09/591,437  
Technology Center 2800

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Decided: August 15, 2007

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Before LANCE LEONARD BARRY, JEAN R. HOMERE, and ST. JOHN  
COURTENAY III, *Administrative Patent Judges*.

HOMERE, *Administrative Patent Judge*.

DECISION ON APPEAL  
STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Examiner's Final Rejection of claims 1 through 10, 12, 14 through 26. Claims 11 and 13 are indicated to contain allowable subject matter. We have jurisdiction under 35 U.S.C. § 6(b) to decide this appeal.

Appellants invented an optical device based on a surface stabilized ferroelectric liquid crystal (SSFLC) structure, which is generally free of chevron structures. Particularly, the invention entails two parallel substrates, each having an alignment treatment applied to its respective surface, and where the alignment projection directions of the two surfaces are separated by a nonzero angle. (Specification 4).

An understanding of the invention can be derived from exemplary independent claim 1, which reads as follows:

1. An optical device including a ferroelectric liquid crystal material, said optical device comprising:

a first and a second substrate;

a first alignment treatment applied to a surface of the first substrate, said first alignment treatment being intended to induce an orientation of at least a portion of said ferroelectric liquid crystal material along a first alignment direction and with a first pretilt angle  $\alpha_1$  with respect to a plane parallel to said first substrate;

a second alignment treatment applied to a surface of the second substrate, said second alignment treatment being intended to induce an orientation of at least another portion of said ferroelectric liquid crystal material along a second alignment direction and with a second pretilt angle  $\alpha_2$  with respect to a plane parallel to said second substrate; and

wherein the first substrate is located with respect to the second substrate in such a way that the surfaces of the first and second substrates onto which the first and second alignment treatments were applied, respectively, are spaced apart generally parallel and facing each other and a projection of the first alignment direction onto the treated surface of the first substrate makes a non-zero angle  $\Omega$  with respect to a projection of the second alignment direction onto the treated surface of the first substrate such that, said ferroelectric liquid crystal material being injected between the first and

second substrates, the optical device is free of chevron structure without a need to otherwise apply an additional treatment to the optical device.

In rejecting the claims on appeal, the Examiner relies upon the following prior art:

Iwayama	US 5,323,253	Jun. 21, 1994
Liu	US 6,141,076	Oct. 31, 2000

The Examiner rejects the claims on appeal as follows:

- A. Claims 1, 3 through 10, 14, 16 through 24, and 26 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Liu.
- B. Claim 25 stands rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the enablement requirement.
- C. Claims 2, 12, and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Iwayama.

## ISSUES

First, regarding the rejection of claims 1, 3 through 10, 14, and 16 through 24, Appellants contend<sup>1</sup> that Liu does not fairly teach or suggest a

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<sup>1</sup> This decision considers only those arguments that Appellants submitted in the Appeal and Reply Briefs. Arguments that Appellants could have made but chose not to make in the Briefs are deemed to have been waived. *See* 37 C.F.R. § 41.37(c)(1) (vii)(2005). *See also In re Watts*, 354 F.3d 1362, 1368, 69 USPQ2d 1453, 1458 (Fed. Cir. 2004).

Appellants did not provide separate arguments with respect to the rejections of claims 1, 3 through 10, 14, and 16 through 24 as being anticipated by Liu and claims 2, 12, and 15 as being unpatentable over the combination of Liu and Iwayama. Therefore, we select independent claim 1 as being representative of Group A, as designated by Appellants. (Br. 8.).

cross buffed (non-zero angle between the alignment directions) device wherein the ferroelectric liquid crystal material is free of chevron structures without the need to apply additional treatment thereto. (Br. 10.) In response, the Examiner contends that Liu's disclosure of a weak or strong buffing technique in a ferroelectric liquid crystal material having two treated cross-buffed parallel substrates with no additional treatment applied thereunto teaches the claimed FLC structure free of chevron structures. (Answer 10-11.)

Regarding the rejection of claim 26 as being anticipated by Liu, Appellants reiterate the contentions offered for claim 1. Further, Appellants contend that Liu does not teach that the first and second substrates are spaced apart by a distance sufficiently small to suppress the formation of helixes typically in bulk of the ferroelectric liquid crystal material. (Br. 14.) In response, the Examiner contends that Liu teaches such limitation. (Answer 12.) Therefore, the Examiner concludes that Liu anticipates these claims. We affirm these rejections.

Second, Appellants contend that claim 25 is enabling since the term "surface stabilized" is widely known in the "ferroelectric liquid crystal art". (Br. 12-13.) In response, the Examiner contends that the cited claim is not enabling since it calls for a limitation which contradicts the teachings of the

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*See In re Young*, 927 F.2d 588, 590, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991). *See also* 37 C.F.R. § 41.37(c)(1)(vii).

We rely and refer to Appellants' Appeal Brief mailed on June 19, 2006 and the Examiner's Answer mailed on September 12, 2006. We note that Appellants' arguments in the Reply Brief are a duplication of the same arguments presented in the Appeal Brief, and the Reply Brief failed to particularly respond to the Examiner's arguments presented in the Answer.

prior art. Particularly, the Examiner contends that the claim calls for using a stabilized surface in ferroelectric liquid crystal material, which contradicts the teaching in the prior art, as disclosed in the Liu patent, which discloses using a non-stabilized surface in a ferroelectric crystal material. We reverse this rejection.

The *pivotal* issues in the appeal before us are as follows:

- (1) Have Appellants shown<sup>2</sup> that the Examiner failed to establish that the disclosure of Liu anticipates the claimed invention under 35 U.S.C. § 102(e). Particularly, does Liu's disclosure of a weak or strong buffing technique in a ferroelectric liquid crystal material having two treated cross-buffed parallel substrates with no additional treatment teach Appellants' claimed FLC material free of chevron structures?
- (2) Has the Examiner established that claim 25 fails to comply with the enablement requirements, as required by 35 U.S.C. § 112, first paragraph?

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<sup>2</sup> In the examination of a patent application, the Examiner bears the initial burden of showing a prima facie case of unpatentability. *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). When that burden is met, the burden then shifts to the applicant to rebut. *Id.*; see also *In re Harris*, 409 F.3d 1339, 1343-44, 74 USPQ2d 1951, 1954-55 (Fed. Cir. 2005) (finding rebuttal evidence unpersuasive). If the applicant produces rebuttal evidence of adequate weight, the prima facie case of unpatentability is dissipated. *In re Piasecki*, 745 F.2d at 1472, 223 USPQ at 788. Thereafter, patentability is determined in view of the entire record. *Id.* However, on appeal to the Board it is an appellant's burden to establish that the Examiner did not sustain the necessary burden and to show that the Examiner erred -- on appeal we will not start with a presumption that the Examiner is wrong.

- (3) Have Appellants shown that the Examiner failed to establish that one of ordinary skill in the art, at the time of the invention, would have found that the combined disclosures of Liu and Iwayama render the claimed invention unpatentable under 35 U.S.C. § 103(a)?

We affirm-in-part.

### FINDINGS OF FACT

The following findings of fact are supported by a preponderance of the evidence.

#### The Invention

1. Appellants invented an optical device (100) free of chevron structures without a need to apply additional treatment thereunto. (Specification 1.)
2. As depicted in Figure 2, the optical device includes a ferroelectric liquid crystal (FLC) structure (10) comprised between a first substrate (32A) and a second substrate (32B). (*Id.* 5.)
3. The surface of each of the substrates (32A, 32B) is aligned with an alignment treatment (110A, 110B respectively) to induce an orientation of a portion of the FLC material along a first and second alignment direction with a first and a second pre-tilt angle, respectively. (*Id.* 5 and 6.)
4. The first and second substrates (32A, 3B) are spaced apart in parallel, in such a way that a projection of the first alignment direction onto the treated surface of the first substrate makes a non-zero angle with respect to the projection of the second alignment direction onto the treated surface of the first surface. (*Id.*)
5. The background of Appellants' invention indicates that a first substrate and a second substrate are known to be spaced apart by a distance

sufficiently small as a way to suppress formation of helixes within an FLC structure. (*Id.* 1.)

6. The background of Appellants' invention also indicates that it is common practice to utilize stabilized surface in an FLC material. (*Id.*)

#### The Prior Art Relied upon

7. Liu teaches a spatial light modulator using an FLC material with a tilt angle of about 20 to 25 degrees. (Abstract.)

8. As depicted in Figure 1, the disclosed FLC material (16) is comprised between two substrates (10, 11), each having an alignment treatment (14, 15) respectively applied thereunto. (Col. 3, ll. 28-32.)

9. The two substrates are spaced apart in parallel, rubbing in different directions in such a way to form a twist angle of 90 and 44 degrees between them. (Col. 3, ll. 34-45.)

10. Liu teaches that when the FLC operates in the stabilized mode, the cell surface is designed to be thin and a strong anchoring energy is used to suppress the resulting helical structure. (Col. 3, ll. 50-57.)

## PRINCIPLES OF LAW

### 1. ENABLEMENT

The standard for determining whether the Specification meets the enablement requirement was cast in the Supreme Court decision of *Mineral Separation v. Hyde*, 242 U.S. 261, 270, 37 S. Ct. 82 (1916) which postured the question: is the experimentation needed to practice the invention undue or unreasonable? That standard is still the one to be applied. *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988). Accordingly, even though the statute does not use the term "undue experimentation," it

has been interpreted to require that the claimed invention be enabled so that any person skilled in the art can make and use the invention without undue experimentation. *In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir. 1988). See also *United States v. Telectronics, Inc.*, 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) (“The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation.”). A patent need not teach, and preferably omits, what is well known in the art. *In re Buchner*, 929 F.2d 660, 661, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384, 231 USPQ 81, 94 (Fed. Cir. 1986), cert. denied, 480 U.S. 947 (1987); and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1463, 221 USPQ 481, 489 (Fed. Cir. 1984). Any part of the specification can support an enabling disclosure, even a background section that discusses, or even disparages, the subject matter disclosed therein. *Callicrate v. Wadsworth Mfg., Inc.*, 427 F.3d 1361, 1374, 77 USPQ2d 1041, 1052 (Fed. Cir. 2005)(discussion of problems with a prior art feature does not mean that one of ordinary skill in the art would not know how to make and use this feature.)

## 2. ANTICIPATION

It is axiomatic that anticipation of a claim under § 102 can be found only if the prior art reference discloses every element of the claim. See *In re King*, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986) and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458, 221 USPQ 481, 485 (Fed. Cir. 1984).

In rejecting claims under 35 U.S.C. § 102, a single prior art reference that discloses, either expressly or inherently, each limitation of a claim invalidates that claim by anticipation. *Perricone v. Medicis Pharmaceutical Corp.*, 432 F.3d 1368, 1375-76, 77 USPQ2d 1321, 1325-26 (Fed. Cir. 2005), citing *Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1565, 24 USPQ2d 1321, 1326 (Fed. Cir. 1992). Anticipation of a patent claim requires a finding that the claim at issue “reads on” a prior art reference. *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1346, 51 USPQ2d 1943, 1945 (Fed. Cir. 1999) (“In other words, if granting patent protection on the disputed claim would allow the patentee to exclude the public from practicing the prior art, then that claim is anticipated, regardless of whether it also covers subject matter not in the prior art.”) (Internal citations omitted).

### 3. OBVIOUSNESS (Prima Facie)

The Supreme Court in *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966), stated that three factual inquiries underpin any determination of obviousness:

Under § 103, [1] the scope and content of the prior art are to be determined; [2] differences between the prior art and the claims at issue are to be ascertained; and [3] the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.

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 Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). *See also In re Piasecki*, 745 F.2d at 1472, 223 USPQ at 788 (Fed. Cir. 1984). Where the claimed subject matter involves more than the simple substitution one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement, a holding of obviousness must be based on “an apparent reason to combine the known elements in the fashion claimed.” *KSR Int’l v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396 (2007). That is, “there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.*, 127 S. Ct. at 1741, 82 USPQ2d at 1396 (quoting *In re Kahn*, 441 F.3d 977, 987, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)). Such reasoning can be based on interrelated teachings of multiple patents, the effects of demands known to the design community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art. *KSR*, 127 S. Ct. at 1740-41, 82 USPQ2d at 1396.

Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Appellant. *Oetiker*, 977 F.2d at 1445, 24 USPQ2d at 1444. *See also Piasecki*, 745 F.2d at 1472, 223 USPQ at 788. 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.

## ANALYSIS

### A. 35 U.S.C. § 112, FIRST PARAGRAPH REJECTION

As set forth in the findings of facts section above, Appellants' background of the invention discusses the use of stabilized surfaces in an FLC material. (Finding 6). Similarly, Liu (the prior art relied upon by the Examiner) discloses the use of such stabilized surface in an FLC material. (Finding 10.) We conclude that one reasonably skilled in the art could make or use the invention from the disclosures in Appellants' Specification coupled with information known in the art (Liu) without undue experimentation. Consequently, in light of these teachings, the ordinarily skilled artisan would have been able to use the stabilized surface in the FLC material at the time of the present invention. It follows that the Examiner erred in rejecting claim 25 as failing to comply with the enablement requirements. Therefore, we reverse this rejection.

### B. 35 U.S.C. § 102(b) REJECTION

As set forth above, representative claim 1 requires two substrates, each having an alignment treatment applied thereunto, spaced apart in parallel with a non-zero angle between their alignment directions such that the ferroelectric liquid crystal material comprised between them is free of chevron structures without the need to apply additional treatment thereunto. We find that Liu reasonably teaches that limitation. As detailed in the Findings of Fact section above, we have found that Liu teaches two glass substrates onto each of which a corresponding alignment treatment is applied. No other treatment was subsequently applied on to said substrates. (Finding 8.) We also found that Liu teaches that the substrates are spaced

apart in parallel with a non zero angle (90 or 44 degrees) between them. (Finding 9.) The Court of Appeals for the Federal Circuit has determined that the absence of a disclosure relating to function does not defeat a finding of anticipation if all the claimed structural limitations are found in the reference. *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). *In Schreiber*, the court held that a funnel-shaped oil dispenser spout anticipated a claimed conical-shaped popcorn dispensing top, even though the function of popcorn dispensing was not taught by the reference, because the reference met all the structural limitations of the claim. *In re Schreiber*, 128 F.3d at 1479, 44 USPQ2d at 1433.

In the instant case, we find that Liu teaches an FLC structure that is equivalent to the structure called for in claim 1. Notwithstanding that Liu does not particularly indicate that the resulting FLC structure is chevron free, we find that the FLC material comprised between Liu's substrates must result in a chevron-free structure in light of Liu's teaching of the cross buffed arrangement of the substrates.

In light of these findings, we conclude that Liu teaches the limitation of a chevron free FLC structure with no additional treatment. It follows that the Examiner did not err in rejecting claims 1, 3 through 10, 14, and 16 through 24 as being anticipated by Liu. We affirm this rejection.

Now, we turn to the rejection of claim 26. We note in addition to the limitations of claim 1, claim 26 requires that the first and second substrates are spaced apart by a distance sufficiently small to suppress formation of helixes typically in bulk of the ferroelectric liquid crystal material. As detailed in the Findings of Fact section above, we found that Liu teaches suppressing the creation of helixes by designing the cell surface to be thin.

(Finding 10.) Additionally, we found that Appellants' own Specification indicates that the practice of suppressing the formation of helical structures by spacing the substrates apart by a small distance is a known practice in the art. (Finding 5.) Furthermore, it has been held that the rule that anticipation requires that every element of a claim appears in a single reference accommodates situations where the common knowledge of "technologists" is not recorded in a reference, i.e., where technical facts are known to those in the field of the invention. *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1269, 20 USPQ2d 1746, 1749-50 (Fed. Cir. 1991). Similarly, *In re Graves*, 69 F.3d 1147, 1152, 36 USPQ2d 1697, 1701 (Fed. Cir. 1995), confirms the longstanding interpretation that the teachings of a reference may be taken in combination with knowledge of the skilled artisan to put the artisan in possession of the claimed invention within 35 U.S.C. § 102 even though the patent does not specifically disclose certain features. Thus, even though Liu does not particularly discuss making the distance between the substrates small as the way to suppress the formation of helical structures, we find that Liu anticipates the claimed invention in view of the fact that such practice was known to those in the field as being a common practice.

In light of these findings, we conclude that the Examiner did not err in rejecting claim 26 as being anticipated by Liu. Therefore, we affirm this rejection.

### C. 35 U.S.C. § 103(a) REJECTION

Now, we turn to the rejection of claims 2, 12, and 15 as being unpatentable over the combination Liu and Iwayama. We note that these dependent claims also require a chevron free FLC structure with no

additional treatment. As detailed in the discussion of representative claim 1 above, we have found that Liu teaches such limitation. In light of these findings, it is our view that one of ordinary skill in the art would have found it obvious to combine the teachings of Liu and Iwayama to yield the invention as claimed. It follows that the Examiner did not err in rejecting claims 2, 12, and 15 as being unpatentable over the combination of Liu and Iwayama. Therefore, we affirm this rejection.

#### CONCLUSION OF LAW

On the record before us, Appellants have not shown that the Examiner failed to establish that Liu anticipates claims 1, 3 through 10, 14, 16 through 24, and 26 under 35 U.S.C. § 102(e). Further Appellants have not shown that the Examiner failed to establish that claims 2, 12 and 15 are unpatentable over the combination of Liu and Iwayama under 35 U.S.C. § 103(a). However, the Examiner failed to establish that claim 25 does not comply with the enablement requirements under 35 U.S.C. § 112, first paragraph.

#### DECISION

We have affirmed the Examiner's decision rejecting claims 1 through 10, 12, 14 through 24, and 26. We have reversed the Examiner's decision rejecting claim 25.

Appeal 2007-1304  
Application 09/591,437

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).

AFFIRMED-IN-PART

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