UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RONGGUANG LIANG and DAVID KESSLER

Appeal 2008-0237
Application 10/139,489
Technology Center 2800

Decided: June 9, 2008

Before KENNETH W. HAIRSTON, ROBERT E. NAPPI, and
SCOTT R. BOALICK, *Administrative Patent Judges*.

HAIRSTON, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants seek our review under 35 U.S.C. § 134 of the Examiner's final rejection of claims 1-10, 13-30, 32, and 33. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

INVENTION

Appellants' claimed invention is directed to uniform irradiation of a substrate, which would be useful for preparation of an alignment layer in liquid crystal display (LCD) fabrication (Spec. 4:13-15). It is a feature of the present invention that it provides a projection system for providing high-intensity radiation in telecentric form (Spec. 4:26-27).

Claim 1, reproduced below, is representative of the subject matter on appeal:

1. An apparatus for uniform irradiation of a substrate, comprising:

(a) a light source for providing source radiation;

(b) a uniformizing component for homogenizing said source radiation to provide a uniform exposure beam having uniform energy across the field;

(c) a polarizer for conditioning said uniform exposure beam to provide a polarized uniform exposure beam; and

(d) a telecentric projection system for projecting said polarized uniform telecentric exposure beam onto the substrate, to control variation and incident angle of said telecentric beam on said substrate;

wherein said telecentric projection system further comprises a lens and a curved mirror for directing said polarized uniform exposure beam toward said substrate; and

wherein said curved mirror is located between said lens and said substrate.

THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Dolgoff	US 5,012,274	Apr. 30, 1991
Gross	US 5,565,979	Oct. 15, 1996
Dove	US 6,332,693 B1	Dec. 25, 2001
De Vaan	US 6,179,425 B1	Jan. 30, 2001
Hansen	US 6,452,724 B1	Sep. 17, 2002 (filled Jun. 26, 2000)

The following rejections are before us for review:

1. Claims 1, 2, 6, 9, 13, 14, 17, 21, 23, 25, 26, 28, and 32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gross in view of De Vaan.

2. Claims 3, 4, 15, 24, and 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gross in view of De Vaan, and further in view of Dove.

3. Claims 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Gross in view of De Vaan, and further in view of Dolgoff.

4. Claims 7, 8, 10, 16, 18-20, 22, 29, 30, and 33 stand rejected over Gross in view of DeVaan and further in view of Hansen.

Initially we note that the Appellants' first argument, on page 4 of the Brief is directed to the finality of the November 17, 2005 Office Action relate to a petitionable matter and not an appealable matter. See Manual of Patent Examining Procedure (MPEP) § 1002 and 1201. Accordingly, we will not review that issue.

OBVIOUSNESS

There are multiple obviousness issues before us regarding whether Appellants have shown that the Examiner erred in rejecting claims 1-10, 13-30, 32, and 33 under 35 U.S.C. § 103(a).

We present these issues as they correspond to, and in the order of, Appellants' presented arguments:

<u>Regarding claims 1, 2, 6, 9, 13, 14, 17, 21, 23, 25, 26, 28, and 32</u>

Did the Examiner err in determining that Gross and De Vann teach or suggest: a) imaging the entire width of the substrate, b) using a uniformized exposure beam, and c) the uniformized component as claimed?

<u>Regarding claims 3, 4, 15, 24, and 27</u>

Did the Examiner err in determining that Gross in view of De Vaan and Dove teach or suggest two light sources as claimed?

<u>Regarding claim 5</u>

Did the Examiner err in determining that Gross in view of De Vaan and Dolgoff teach or suggest a heat sink as claimed?

Regarding claims 7, 8, 10, 16, 18, 20, 22, 29, 30, and 33

a) Did the Examiner err in determining that Gross in view of De Vaan and Hansen teach or suggest a telecentric projection system having polarizers (i.e., lenslet array or wire-grid polarizer) as claimed?

b) Did the Examiner err in determining that Gross in view of De Vaan and Hansen teach or suggest a substrate for liquid-crystal device fabrication as claimed in claim 16?

c) Did the Examiner err in not identifying a polarizer adjacent the substrate in Hansen?

d) Did the Examiner err in determining that Gross in view of De Vaan and Hansen teach or suggest a telecentric projection system with a curved mirror as claimed?

e) Did the Examiner err in determining that Gross in view of De Vaan and Hansen teach or suggest "a polarizer rotated to a second position" as claimed?

FINDINGS OF FACT

The relevant facts include the following:

1. While Gross does not teach the use of a uniformizing component, nonetheless, Gross suggests that uniformity is desirable (col. 1, ll. 44-48).
2. De Vaan teaches that an integrating bar/bar-shaped integrator may be used to create a uniform light beam (col. 4, ll. 24-28).
3. Gross suggests that uniformizing optics would result a circular beam of a desired diameter across the scanning surface (col. 1, ll. 44-48).

4. Dove teaches the use of an optical combiner to combine the light of the two sources into a single light beam (i.e., elements 801, 802, and Abstract).
5. Dove teaches that multiple lamps would illuminate a larger area of the substrate (col. 17, ll. 19-46).
6. Gross teaches a telecentric projection system having a polarizer (i.e., polarizer 22 and col. 4, ll. 27-34).
7. Hansen teaches specific types of polarizers (i.e., Brewster plate polarizers (col. 3, ll. 12-15) and wire-grid polarizer (col. 8, ll. 8-15))

PRINCIPLES OF LAW

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S. Ct. at 1734 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.")

The Examiner's "articulated reasoning . . . in the rejection must possess a rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). The Supreme Court, citing *In re Kahn*, 441 F.3d at 988, stated that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. at 1741. However, "the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *Id.*

"One cannot show non-obviousness by attacking references individually where . . . the rejections are based on combinations of references." *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). The test of obviousness is what the "combined teachings would have suggested to those of ordinary skill in the art." *Id*.

Although claims are interpreted in light of the specification, limitations from the specification are not read into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 697 (Fed. Cir. 1985).

ANALYSIS

Regarding claims 1, 2, 6, 9, 13, 14, 17, 21, 23, 25, 26, 28, and 32

a) Did the Examiner err in determining that Gross and De Vann teach or suggest imaging the entire width of the substrate?

The Appellants argues that: "[t]he Gross reference uses an apparatus to focus a spot of light on a substrate, and the spot of light is scanned back and forth across the substrate. In the present invention the entire width of the substrate is imaged with a uniform telecentric irradiation. Thus, in the present invention the entire width of the substrate is imaged at the same time" (Br. 5).

The Examiner responds that the limitation of imaging the entire width at the same time is not claimed, and, thus, Gross does not have to teach this limitation (Ans. 9).

Initially, we note that Appellants' arguments have grouped claims 1, 2, 6, 9, 13, 14, 17, 21, 23, 25, 26, 28, and 32 together. Thus in accordance with 37 CFR §41.37(c)(1)(vii) we select claim 1 as representative of the group of claims. Appellants have not identified the limitation in claim 1 which recites imaging the entire width at the same time, nor do we find any such limitation. While Appellants' specification may describe this operation, as stated supra, although claims are interpreted in light of the specification, limitations from the specification are not read into the claims. In re Van Geuns, 988 F.2d at 1184. Thus, Appellants' argument has not persuaded us of error in the Examiner's rejection since imaging of the entire width at the same time is not claimed.

b) Did the Examiner err in determining that Gross and De Vann teach or suggest using a uniformized exposure beam?

Appellants argue that "[a]nother advantage of the present invention over Gross is that scanning a spot across a substrate as disclosed by Gross is susceptible to uniformity problems as the spot is moved across the substrate " (Br. 5).

The Examiner responds that De Vaan was used to teach the inclusion of uniformizing optics that would prevent uniformity problems (Ans. 9).

As stated *supra*, "one cannot show non-obviousness by attacking references individually where . . . the rejections are based on combinations of references." *In re Keller*, 642 F.2d at 426. While Gross does not teach the use of a uniformizing component, nonetheless, Gross suggests that uniformity is desirable (Finding of Fact 1). De Vaan teaches that an integrating bar/bar-shaped integrator may be used to create a uniform light beam (Finding of Fact 2).

Thus, Appellants' argument has not persuaded of error in the Examiner's rejection of claim 1 because the rejection is based on the combination of Gross and De Vaan (Findings of Fact 1 and 2) and De Vann teaches the limitation which Appellants assert is missing from Gross.

c) Did the Examiner err in determining that Gross and De Vann teach or suggest the uniformized component as claimed?

Appellants further argue the following:

> Another difference between the Gross reference and the claims of the present invention is the use of the term 'uniform.' Referring to Gross, Col. 1, lines 44-48, when Gross discusses use of a spherical mirror in combination with other optics to achieve 'a uniformly focused circular beam,' he is discussing the Gaussian distribution of energy in the circular profile of the focused beam, i.e., the traveling

> spot. This is different from the uniformized exposure beam in the claims of the present invention wherein the profile across the entire width of the beam is uniform as far as exposure energy. It is well known that 'a uniformizing component' which homogenizes input light to form a uniform exposure beam, is different than adjusting Gaussian distribution of a spot of light to provide a uniformly focused beam.

(Br. 5).

Claim 1 recites "a uniform exposure beam having uniform energy across a field." Gross suggests that uniformizing optics would result in a circular beam of a desired diameter across the scanning surface (Finding of Fact 3). Thus, the combination of Gross with De Vaan would yield a circular beam across the scanning surface which would provide "a uniform exposure beam having uniform energy across a field" of scanning. Note that the claim does not recite that the uniform energy across the field occurs across the width of the substrate at the same time. As stated *supra*, although claims are interpreted in light of the specification, limitations from the specification are not read into the claims. *In re Van Geuns*, 988 F.2d at 1184.

Thus, Appellants' argument has not persuaded us of error in the Examiner's rejection because the uniformly focused beam when scanned across the scanning surface would yield "a uniform exposure beam having uniform energy across a field."

For the above reasons, Appellants' arguments have not persuaded us of error in the Examiner's rejection of claims 1, 2, 6, 9, 13, 14, 17, 21, 23, 25, 26, 28, and

32 under 35 U.S.C. § 103(a) as being unpatentable over Gross in view of De Vaan, and we sustain the Examiner's rejection.

<u>Regarding claims 3, 4, 15, 24, and 27</u>

Did the Examiner err in determining that Gross in view of De Vaan and Dove teach or suggest two light sources as claimed?

Appellants argue that "[b]ecause of the small dimensions of the elliptical spot that is scanned across the wafer in Gross, it is not readily apparent how an apparatus can be constructed using the two light sources in the Dove et al. that would function in a similar fashion to the present invention" (Br. 6).

The Examiner responds that Dove teaches the use of an optical combiner to combine the light of the two sources into a single light beam (i.e., elements 801, 802) (Finding of Fact 4), and, therefore, there is no reason to expect Gross not to work due to the modification (Ans. 10). The Examiner's articulated reasoning in the rejection, that multiple lamps would illuminate a larger area of the substrate (Finding of Fact 5 and Ans. 5), possesses a rational underpinning to support the legal conclusion of obviousness. *In re Kahn*, 441 F.3d at 988.

Thus, we agree with the Examiner's findings of fact and conclusions and adopt them as our own.

Furthermore, we are not persuaded by Appellants' argument that there is at least one limitation of the claimed invention not disclosed by the references either individually or in combination (Br. 6), because Appellants do not point out which limitation is missing.

For the above reasons, Appellants' arguments have not persuaded us of error in the Examiner's rejection of claims 3, 4, 15, 24, and 27 under 35 U.S.C. § 103(a)

as being unpatentable over Gross in view of De Vaan and Dove, and we sustain the Examiner's rejection.

Regarding claim 5

Did the Examiner err in determining that Gross in view of De Vaan and Dolgoff teach or suggest a heat sink as claimed?

Appellants argue that "the component being cooled in the present invention, the reflecting mirror for the high intensity lamp, is different than the heat sink of Dolgoff which is used for maintaining a temperature of the LCD. It is instructive to note that Dolgoff teaches one way to reduce the heating effects on the LCD is to use 'reflective optics.' This is contrasted with the present invention which uses reflective optics, and it is the reflective optics themselves that must be cooled" (Br. 7) (emphasis in original).

The Examiner responds that "the claim language states 'an apparatus for irradiating a substrate according to claim 1 further comprising a heat sink.' Nowhere in the claim is the location of the heat sink or the element the heat sink cools mentioned" (Ans. 10).

As stated *supra*, although claims are interpreted in light of the specification, limitations from the specification are not read into the claims. *In re Van Geuns*, 988 F.2d at 1184.

Thus, we agree with the Examiner's findings of fact and conclusions and adopt them as our own.

For the above reasons, Appellants' arguments have not persuaded us of error in the Examiner's rejection of claim 5 under 35 U.S.C. § 103(a) as being

unpatentable over Gross in view of De Vaan and Dolgoff, and we sustain the Examiner's rejection.

<u>Regarding claims 7, 8, 10, 16, 18, 20, 22, 29, 30, and 33</u>

a) Did the Examiner err in determining that Gross in view of De Vaan and Hansen teach or suggest a telecentric projection system having polarizers (i.e., lenslet array or wire-grid polarizer) as claimed?

Appellants argue that Hansen does not teach a telecentric projection system (Br. 7). Appellants further argue that Hansen does not teach how the Brewster plates and wire grid polarizers of Hansen would be used to provide telecentric projection (Br. 6-7).

The Examiner responds that Gross teaches the telecentric projection system having a polarizer (Finding of Fact 6), and Hansen is merely used to teach specific types of polarizers (Finding of Fact 7) that could be used in the Gross invention (Ans. 10-11).

As stated *supra*, "one cannot show non-obviousness by attacking references individually where . . . the rejections are based on combinations of references." *In re Keller*, 642 F.2d at 426.

Thus, Appellants' argument has not persuaded us of error in the Examiner's rejection of claims 7, 8, 10, 16, 18, 20, 22, 29, 30, and 33 because the rejection is based on the combination of Gross, De Vaan, and Hansen (Findings of Fact 6 and 7) and Gross teaches the limitation which Appellants assert is missing from Hansen.

b) Did the Examiner err in determining that Gross in view of De Vaan and Hansen teach or suggest a substrate for liquid-crystal device fabrication as claimed in claim 16?

Appellants argue the following:

> The liquid crystal device (LCD) disclosed in Hansen et al. is a finished device such as a spatial light modulator. There is no mention in Hansen et al. of fabrication of such a device, but only an explanation of how the Hansen et al. system is used in cooperation with an LCD . . . the substrate in the present invention is material which is aligned and made suitable for subsequent use in devices such as LCDs . . . The material manufactured by the present invention would be used in the LCD described by Hansen et al.

(Br. 8).

Appellants' argument is not commensurate in scope with the claim language, in that Appellants seem to argue that claim 16 is a product-by-process claim. However, we find that only the intended use of the substrate is claimed (i.e., the substrate is to be used in an LCD). Therefore, because the substrate of the prior art is capable of being used in an LCD, the claim language is met. Furthermore, even if this was a product-by-process claim, the final product is an LCD display, and thus, the claim would still be unpatentable even though the product was made by a different process. *In re Thorpe*, 777 F.2d at 697.

For the above reasons, Appellants' arguments have not persuaded us of error in the Examiner's rejection of claim 16 under 35 U.S.C. § 103(a) as being unpatentable over Gross in view of De Vaan and Hansen, and we sustain the Examiner's rejection.

c) Did the Examiner err in not identifying a polarizer adjacent the substrate in Hansen?

Appellants further argue that Hansen does not teach a polarizer adjacent the substrate (Br. 8). The Examiner notes that the claim language does not require a polarizer next to the substrate (Ans. 11).

As stated *supra*, although claims are interpreted in light of the specification, limitations from the specification are not read into the claims. *In re Van Geuns*, 988 F.2d at 1184.

Thus, we agree with the Examiner's findings of fact and conclusions and adopt them as our own.

For the above reasons, Appellants' argument has not persuaded us of error in the Examiner's rejection of claims 7, 8, 10, 16, 18, 20, 22, 29, 30, and 33 under 35 U.S.C. § 103(a) as being unpatentable over Gross in view of De Vaan and Hansen, and we sustain the Examiner's rejection.

d) Did the Examiner err in determining that Gross in view of De Vaan and Hansen teach or suggest a telecentric projection system with a curved mirror as claimed?

Appellants argue that Hansen fails to teach a curved mirror used as part of the telecentric projection system to make light telecentric to the substrate and control the incident angle (Br. 8-9).

The Examiner responds that Gross was used to teach the telecentric projection system with the curved mirror (Ans. 11).

As stated *supra*, "one cannot show non-obviousness by attacking references individually where . . . the rejections are based on combinations of references." *In re Keller*, 642 F.2d at 426.

Thus, Appellants' argument has not persuaded us of error in the Examiner's rejection of claims 7, 8, 10, 16, 18, 20, 22, 29, 30, and 33 because the rejection is based on the combination of Gross, De Vaan, and Hansen and Gross (Ans. 11) teaches the limitation which Appellants assert is missing from Hansen.

e) Did the Examiner err in determining that Gross in view of De Vaan and Hansen teach or suggest "a polarizer rotated to a second position" as claimed?

Appellants argue that "[i]t should be clear from the terminology that rotating a polarization state is different than rotating a polarizer as in claim 33 of the present invention" (Br. 9).

The Examiner responds:

> The claim language requires a polarizer rotated to a first position and a polarizer rotated to a second position. The examiner interprets this as two separate polarizers not a single rotating polarizer. The examiner's interpretation is supported by the claim language, which states, 'a polarizer rotated to a second position.' (Emphasis added) If the claim language stated, 'said polarizer rotated to a second position,' then the claim language may be interpreted as including a rotating polarizer. The polarization reorientation device (118) of Hansen is a first polarizer and the elements (120) is a second polarizer tilted with respect to the optical axis (col. 23 lines 37-39). The elements (120) are a polarizer because it only allows light of a certain polarization to pass (col. 23 lines 45-50). Therefore the prior art meets the claim limitation based on the claim language.

(Ans. 11-12).

We agree with the Examiner's findings of fact and conclusions and adopt them as our own.

Furthermore, with respect to the Appellants' argument regarding claim 33 that the combination does not teach how the LCD is made (Br. 9), we note that claim 33 does not recite anything about an LCD. Thus, Appellants' argument is not commensurate in scope with the claim language.

For the above reasons, Appellants' arguments have not persuaded us of error in the Examiner's rejection of claim 33 under 35 U.S.C. § 103(a) as being unpatentable over Gross in view of De Vaan and Hansen, and we sustain the Examiner's rejection.

For the foregoing reasons, we find that the Examiner did not err in rejecting claims 1-10, 13-30, 32, and 33 under 35 U.S.C. § 103(a).

CONCLUSIONS OF LAW

We conclude that the Appellants have not shown that the Examiner erred in rejecting claims 1-10, 13-30, 32, and 33 under 35 U.S.C. § 103(a).

DECISION

The decision of the Examiner to reject claims 1-10, 13-30, 32, and 33 is affirmed.

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

KIS

Milton S. Sales
Patent Legal Staff
Eastman Kodak Company
343 State Street
Rochester, NY 14650-2201