

# United States Court of Appeals for the Federal Circuit

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IN RE DORON ADLER, OFRA ZINATY, DAPHNA  
LEVY AND ARKADY GLUKHOVSKY

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2012-1610

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Appeal from the United States Patent and Trademark Office, Board of Patent Appeals and Interferences in Application No. 10/097,096.

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Decided: July 18, 2013

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GUY YONAY, Pearl Cohen Zedek Latzer LLP, of New York, New York, argued for appellants.

JAMIE L. SIMPSON, Associate Solicitor, United States Patent and Trademark Office, of Alexandria, Virginia, argued for appellee. With her on the brief were RAYMOND T. CHEN, Solicitor, and BRIAN T. RACILLA, Associate Solicitor.

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Before PROST, REYNA, and WALLACH, *Circuit Judges*.

WALLACH, *Circuit Judge*.

Doron Adler, Ofra Zinaty, Daphna Levy, and Arkady Glukhovsky (collectively, “Adler”) are the named inventors on U.S. Patent Application No. 10/097,096 (“the ’096

application”). The examiner rejected all of the pending claims—claims 57, 59, 61, 63–67, and 71—under 35 U.S.C. § 103 as obvious over several prior art references, including International Patent Publication WO 00/22975 (“Meron”) in view of Masaru Hirata et al., STUDY OF NEW PROGNOSTIC FACTORS OF ESOPHAGEAL VARICEAL RUPTURE BY USE OF IMAGE PROCESSING WITH A VIDEO ENDOSCOPE, 116 SURGERY 8–16 (1994) (“Hirata”). Adler appeals from the decision of the Board of Patent Appeals and Interferences (“the Board”) affirming the examiner’s rejection with respect to Meron in view of Hirata. *Ex parte Doron Adler, Ofra Zinaty, Daphna Levy, and Arkady Glukhovsky*, No. 2010-012509, 2012 Pat. App. LEXIS 2387 (B.P.A.I. May 8, 2012) (“Board Decision”). Because the Board did not err in rejecting the pending claims as obvious and did not rely on new grounds for rejection, we affirm.

#### BACKGROUND

According to the background of the ’096 application, “[p]athologies of the gastrointestinal (“GI”) tract may exist for a variety of reasons such as bleeding, lesions, angioidioplasia, Crohn’s disease, polyps, celiac disorders, and others.” ’096 application col. 1 ll. 11–15. However, because these pathologies are found in the GI tract, it can be difficult to detect the pathologies or even “see” inside the tract, even though “the majority of pathologies result in changes of color and/or texture of the inner surface of the GI tract” and “may be due to bleeding.” *Id.* at col. 1 ll. 14–21.

The ’096 application is directed, *inter alia*, to a system “for detection of blood within a body lumen,” e.g., the esophagus. *Id.* at col. 3 l. 28. The system “includes a swallowable capsule having an in-vivo imager for obtaining images from within the body lumen.” *Id.* at col. 3 ll. 28–30. Those images can be compared to two reference values, one for healthy tissue and one for blood; as ex-

plained by Adler, “[b]ased on the comparisons, an indication of the position in the GI tract of a change in the level of red color content, correlating to the presence of blood, is displayed,” thereby allowing for the detection of colorimetric abnormality such as bleeding or blood clots. Appellant’s Br. 6–7.

Claim 57 is representative and reads as follows:

57. A method for displaying in-vivo information, the method comprising:

receiving at a data processor data generated by a swallowable in-vivo device traversing a GI tract, the data comprising a set of in-vivo images of the GI tract;

*the data processor comparing values of the received images to a reference value of blood and to a reference value of healthy tissue;*

the data processor causing to be displayed the images as a color video; and

*the data processor further, based on the comparison, causing to be displayed an indication of the position in the GI tract of a change in the level of red color content, the change correlating to the presence of blood.*

’096 application, Claim 57 (emphases added).<sup>1</sup>

The examiner rejected the claims at issue as being obvious over Meron in view of Hirata. Meron discloses “a method for identifying a target location in the gastrointes-

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<sup>1</sup> Both independent claims 57 and 63 are on appeal; however, Adler argues only claim 57, incorporating the same arguments by reference to claim 63. See Appellant’s Br. 7. The dependent claims at issue rise and fall with the independent claims. *Id.*

tinal tract and for direct delivery of a device to the identified location.” Meron col. 1 ll. 4–5. Meron states that “[t]he method of the present invention may be used for research, diagnostic[,] or therapeutic purposes in the gastrointestinal tract.” *Id.* at col. 6 ll. 22–23. The examiner found that “Meron discloses a capsule that moves through the [GI] tract in order to generate a map of the GI tract.” J.A. 26. However, the examiner determined that although the device *could* include a sensor for detecting the presence of blood, “Meron does not specifically disclose a method of detecting the presence of blood.” *Id.* (citing Meron col. 9 ll. 1–2).

The examiner found that Hirata “teaches a study of factors of esophageal variceal rupture by use of image processing with a video endoscope.”<sup>2</sup> *Id.* The examiner stated that in Hirata, “bleeders” and “non-bleeders” were compared “in terms of endoscopic findings and the image processing data, especially variceal color tone and red color sign.” *Id.* Additionally, red color signs were classified by degree, with a minor degree indicating a reference of healthy tissue and a major degree indicating a reference of blood.

According to the examiner, “[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a processor for the colorimetric analysis of video endoscopic data, as taught by Hirata, in order to determine the presence of blood, as

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<sup>2</sup> A varix is (1) “[a] dilated vein” or (2) “[a]n enlarged and tortuous vein, artery, or lymphatic vessel.” LARRY P. TILLEY, FRANCIS W. K. SMITH, & DANA ALLEN, STEDMAN’S MEDICAL DICTIONARY (27th ed. 2000). Specific to the above prior art, esophageal varices are “longitudinal venous varices at the lower end of the esophagus as a result of portal hypertension; they are superficial and liable to ulceration and massive bleeding.” *Id.*

stated by Meron.” *Id.* The examiner reasoned that it would have been obvious “because Meron states that it is capable [of determining the presence of blood] but fails to provide the specifics of how . . . while Hirata provides a method and a processor capable of performing these feats.” *Id.*

Adler appealed the examiner’s rejections, and the Board affirmed. Of importance to this appeal, the Board made the following findings of fact with respect to Hirata:

12. Hirata discloses that *color tone* was analyzed by comparing the color tone of a defined varices region with the color tone of a defined normal esophageal region.

13. Hirata discloses that the *area of red color sign* was also determined for a defined varices region.

14. Hirata discloses that, using image processing, *both color tone results and area of red color sign results could be used* to select patients with varices that have a higher risk of rupture.

Board Decision at \*7–8 (emphasis added) (citations omitted).

Adler filed this timely appeal. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(4)(A).

#### DISCUSSION

This court reviews the Board’s legal conclusions *de novo*, *In re Elsner*, 381 F.3d 1125, 1127 (Fed. Cir. 2004), and the Board’s factual findings underlying those determinations for substantial evidence, *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). A finding is supported by substantial evidence if a reasonable mind might accept it as adequate to support the finding. *Consol. Edison Co. v. Nat’l Labor Relations Bd.*, 305 U.S. 197, 229 (1938).

“The ultimate judgment of obviousness is a legal determination,” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 427 (2007), which we review *de novo*, *Procter & Gamble Co. v. Teva Pharm. USA, Inc.*, 566 F.3d 989, 993 (Fed. Cir. 2009). A conclusion of obviousness rests on the following factual findings: (1) the scope and content of the prior art; (2) the differences between the prior art and the claimed invention; (3) the level of ordinary skill in the art at the time of the invention; and (4) objective indicia of nonobviousness. *KSR Int’l Co.*, 550 U.S. at 406 (quoting *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966)).

### 1. The Board Did Not Err in Its Obviousness Determination

Adler does not dispute that the prior art discloses a swallowable sensing device capable of transmitting images and location information to an external display. The primary issue on appeal is whether the Board properly found that it would have been obvious in light of the prior art to compare reference values for healthy tissue and blood to determine whether images of the gastrointestinal tract showed “a change in the level of red color content” where that “change correlat[es] to the presence of blood,” as articulated in the claims at issue. J.A. 143. The Board concluded that it would have been obvious, because a skilled artisan would have been motivated to combine Hirata—which discloses methods for comparison of the red color content of two reference values of tissue—with Meron, based on Meron’s suggestion that the *in vivo* camera could include a means for detecting the presence of blood. Board Decision at \*8–9.

Adler contends that the Board failed to appreciate that Adler’s claims refer to two comparisons. Appellant’s Br. 22. The values of the received images are compared to (1) a value for healthy tissue and (2) a value for blood. *Id.* According to Adler, the Board failed to properly analyze

the claim, and did not take into consideration this two-prong limitation. *Id.*

The Board, however, did appreciate that the claim requires two comparisons and found that they were both disclosed by Hirata. The Board stated that “Hirata discloses that color tone was analyzed by comparing the color tone of a defined varices region with the color tone of a defined normal esophageal region.” Board Decision at \*7 (citing Hirata at 11). This finding is supported by substantial evidence. Hirata explains how the two color tones are used to form a ratio value termed “Rr.” J.A. 70.<sup>3</sup> In response to Adler’s argument below, the Board repeated this finding, explaining that “Hirata discloses comparing the color tone of a known variceal region with the color tone of a known healthy esophageal region.” Board Decision at \*10. Indeed, Hirata made such comparisons in his follow-up study of the non-bleeders, when he compared the color tone of non-bleeders with the color tone of bleeders—Hirata was taking a (new) test sample from the non-bleeders and comparing it to the “Rr” of the bleeders, where “Rr” represents a combined reference value of healthy tissue and a reference value of blood. J.A. 72.

Adler responds that “[t]he claim requires three values to be used in the two comparisons” and that “Hirata discloses one comparison of two values.” Appellant’s Reply Br. 10. Adler contends that one of ordinary skill in the art would not have turned to Hirata because it discusses future bleeding. *See* Appellant’s Br. 27–30. Adler’s argu-

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<sup>3</sup> Specifically, Hirata states that two “square region[s] of interest” from an image were selected to form the ratio: “We defined one square region of interest . . . as region V on the largest esophageal varices in the image . . . We also defined similarly one square region of interest . . . as region E on the esophageal mucosa without varices.” J.A. 70.

ments overlook the Board’s rationale, which explains that one of ordinary skill in the art would equate red color with present bleeding and would be motivated to build on Meron’s teachings concerning received images from a swallowable device that could be compared to the reference values disclosed in Hirata. This is a predictable variation of the combination of Hirata and Meron. *See KSR*, 550 U.S. at 417 (“If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability.”).<sup>4</sup>

## 2. The Board Did Not Rely On New Grounds For Rejection

Additionally, Adler argues that the Board relied on a new ground for rejection of the claims at issue and instead should have reopened prosecution. Appellant’s Br. 14. Adler contends that the Board’s “facts and rationale for the affirmance (Hirata’s image processing and colorimetric analysis) changed the thrust of the Examiner’s rejection (Hirata’s classification of red color signs).” *Id.* Adler offers the following comparison to illustrate its argument:

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<sup>4</sup> As indicated above, a main contention underlying many of Adler’s arguments is that Hirata does not detect actual blood. *See* Appellant’s Br. 25–30; Appellant’s Reply Br. 13–15. However, substantial evidence supports the Board’s finding that Hirata teaches identification of a pathology through red color image analysis of two reference values; one of ordinary skill in the art would understand that detecting areas with different red color values corresponds to blood. *See* Board Decision at \*8–9.

Examiner's Decision	Board's Decision
<p><i>"Red color signs</i> were classified in a minor degree, which indicated negative or mild (or a reference of healthy), and a major degree, which indicated moderate or severe (or a reference of blood) . . ."</p>	<p>"Appellants also argue that 'Hirata did not teach comparing image to a reference value of blood, and . . . a reference value of healthy tissue' . . . Hirata discloses comparing the <i>color tone</i> of a known variceal region with the <i>color tone</i> of a known healthy esophageal region."</p>

Appellant's Reply Br. 4 (citations omitted) (emphasis in original).

When the Board relies upon a new ground of rejection not relied upon by the examiner, the applicant is entitled to reopen prosecution or to request a rehearing. 37 C.F.R. § 41.50(b). This court has stated that "[t]he thrust of the Board's rejection changes when . . . it finds facts not found by the examiner regarding the differences between the prior art and the claimed invention, and these facts are the principal evidence upon which the Board's rejection was based." *In re Leithem*, 661 F.3d 1316, 1320 (Fed. Cir. 2011). "[T]he ultimate criterion of whether a rejection is considered 'new' in a decision by the [B]oard is whether [applicants] have had fair opportunity to react to the thrust of the rejection." *Id.* (quoting *In re Kronig*, 539 F.2d 1300, 1302–03 (C.C.P.A. 1976) (modifications in original)).

Here, Adler mischaracterizes the examiner's grounds for rejection, and neither points to specific facts found by the Board but not by the examiner, nor illustrates how any such facts formed the basis of the Board's rejection. In fact, in rejecting Adler's application, the examiner

relied on Hirata's disclosure of both red color sign and red color tone, not just its use of the color sign classification. The examiner stated that "Hirata teaches a study of factors of esophageal variceal rupture by use of image processing with a video endoscope." J.A. 26. The examiner explained that "[a] comparison was made between bleeders and non-bleeders in terms of endoscopic findings and the image processing data, especially variceal color tone *and* red color sign." *Id.* (emphasis added). The examiner referred to the video image processing again in his summation of the obviousness rejection: "It would have been obvious . . . to incorporate a processor for the *colorimetric analysis of video endoscopic data*, as taught by Hirata, in order to determine the presence of blood, as stated by Meron . . ." *Id.* at 27 (emphasis added). Thus, in contrast to Adler's contention that the "examiner made no mention of colorimetric analysis," Appellant's Br. 17, the examiner expressly referred to that feature of Hirata by name.

Adler appears to have appreciated the examiner's position, based on Adler's characterization in its Reply Brief to the Board: "On pages 8 and 9 of the Examiner's Answer, the Examiner states that Hirata performs color analysis on varices and that Hirata's disclosure would lead one skilled in the art to focus on the possibility of processing electronic images for quantification of colorimetric data, and that image processing could determine the bleeding point." J.A. 98. Because Adler had the opportunity to respond, and in fact did respond, to the thrust of the examiner's basis for rejecting the claims, this case differs from those cited by Adler, where the Board made new factual findings that the applicants did not have an opportunity to address.

While the Board's explanation may go into more detail than the examiner's, that does not amount to a new ground of rejection. See *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011).

**CONCLUSION**

Because the Board did not err in rejecting the pending claims as obvious over Meron in view of Hirata and did not rely on new grounds for rejection, the Board is

**AFFIRMED.**