

United States Court of Appeals
for the Federal Circuit

Q. I. PRESS CONTROLS, B.V.,
Appellant,

v.

MICHELLE K. LEE, Deputy Director,
United States Patent and Trademark Office,
Appellee,

AND

QUAD/TECH, INC.,
Cross-Appellant.

2012-1630, -1631

Appeals from the United States Patent and Trademark Office, Board of Patent Appeals and Interferences in Reexamination No. 95/000,526.

Decided: June 9, 2014

DAVID D. LANGFITT, Locks Law Firm, of Philadelphia, Pennsylvania, argued for appellant.

SYDNEY O. JOHNSON, JR., Associate Solicitor, United States Patent and Trademark Office, of Alexandria, Virginia, argued for appellee. With him on the brief were

NATHAN K. KELLEY, Deputy General Counsel for Intellectual Property Law and Solicitor, THOMAS W. KRAUSE, Special Counsel for IP Litigation, and JOSEPH G. PICCOLO, Associate Solicitor.

MATTHEW B. LOWRIE, Foley & Lardner LLP, of Boston, Massachusetts, argued for cross-appellant. With him on the brief was BRETT P. BELDEN, of Milwaukee, Wisconsin. Of counsel was JASON PAULS, Quad/Graphics, Inc., of Sussex, Wisconsin.

Before LOURIE, BRYSON, and HUGHES, *Circuit Judges*.

LOURIE, *Circuit Judge*.

Q.I. Press Controls, B.V. (“Q.I. Press”) appeals from the decision of the United States Patent and Trademark Office (“PTO”) Board of Patent Appeals and Interferences (“the Board”) reversing both the examiner’s obviousness rejection of claims 1–17 and 19–60 and written description rejection of claims 14 and 24 of U.S. Patent 6,867,423 (the “423 patent”) in an *inter partes* reexamination. See *Q.I. Press Controls, B.V. v. Quad/Tech, Inc.*, No. 2012-002457 (B.P.A.I. May 11, 2012) (“Board Decision”).¹ Quad/Tech, Inc. (“Quad/Tech”) cross-appeals from the Board’s decision affirming the examiner’s rejection of the ’423 patent’s claims 61–72 as obvious and claim 18 for

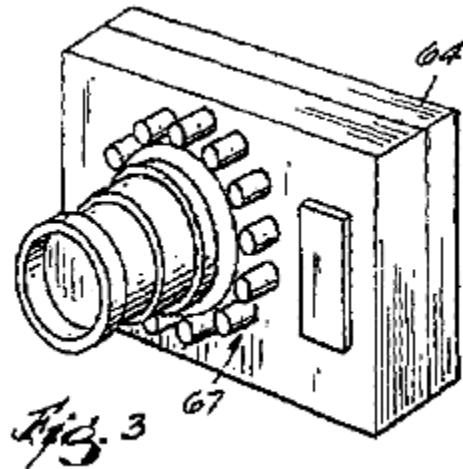
¹ The Leahy-Smith America Invents Act amended the *inter partes* reexamination provisions. See Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 6, 125 Stat. 284, 299–305 (2011) (“AIA”). Those amendments do not apply here because the request for *inter partes* reexamination in this case was filed before the date of enactment, September 16, 2011. *Id.* We thus express no opinion on the applicability of the AIA provisions to the current case.

failing to meet the requirements of § 112, ¶1.² Because the Board erred in failing to consider the same obviousness rejection of claims 61–72 in connection with claims 1–17 and 19–60, but did not otherwise err, we vacate in part, affirm in part, and remand.

BACKGROUND

Quad/Tech owns the '423 patent, which relates to a visual inspection system for printing presses. '423 patent col. 2 ll. 13–15. The '423 patent discloses an imaging system for web printing (*i.e.*, printing with large rolls of paper) that uses an image sensor system containing an optical sensor to inspect printed pages (the “substrate”) for defects, *viz.*, misalignments or poor color, in order to change the printing process to correct those errors. *Id.* col. 5 l. 16–col. 7 l. 56. A circular configuration of light-emitting diodes (“LEDs”) surrounds the image sensor and illuminates the substrate. *Id.* The circular configuration of LEDs is depicted in figure 3, reproduced below:

² Paragraph 1 of 35 U.S.C. § 112 was replaced with newly designated § 112(a) by § 4(c) of the AIA, and AIA § 4(e) makes those changes applicable “to any patent application that is filed on or after” September 16, 2012. Because the application resulting in the patent at issue was filed before that date, we will refer to the pre-AIA version of § 112.



Id. fig. 3. Claim 1 is representative of claims 1–60 and reads as follows:

1. A visual inspection system configured to be in optical communication with a substrate of a printing press, said visual inspection system comprising:
 - a CMOS image recording device configured to record images printed on the substrate,
 - a processing unit coupled to the recording device, wherein the processing unit is configured to generate an output, and
 - an illumination system of the non-strobe, non-incandescent type, wherein said illumination system includes a plurality of LEDs wherein said plurality of LEDs are in a circular configuration.

Id. col. 9 ll. 45–56. Claims 14 and 24, also on appeal, are similar to claim 1 but require “a sensor, wherein the LEDs are disposed between the sensor and the substrate of the printing press.” *E.g.*, Response to Office Action and

Amendment, No. 95/000,526, at 8, 9 (Apr. 2, 2010) (“*Claim Amendments*”). Claim 18 is also similar to claim 1, adding the requirement that “the substrate of the printing press is unsupported at the point where the substrate is configured to be illuminated by the illumination arrangement.” *Id.* at 8.

Claim 61 is representative of claims 61–72 and reads as follows:

61. . . . A visual inspection system configured to be in optical communication with a substrate of a printing press, wherein the substrate has a printed image, said visual inspection system comprising:

an image recording device configured to acquire a two-dimensional image from a substrate on a printing press, wherein the image recording device comprises at least a sensor, wherein the sensor is in optical communication with the substrate along an optical communication path; and

an illumination system comprising a plurality of LEDs that are disposed in a configuration surrounding the optical communication path between the substrate and the image recording device, wherein the illumination system is adapted to illuminate the substrate of the printing press; and

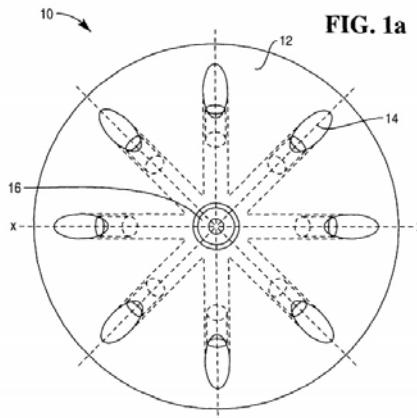
a processing circuit coupled to the image recording device and configured to process the image to control the printing press.

Id. at 13–14.

Q.I. Press, a developer of optical measure and control systems including a product that Quad/Tech alleged to infringe the ’423 patent in a related case, initiated an

inter partes reexamination of the '423 patent, alleging that the claims would have been obvious over various prior art references. The references cited by both parties in the reexamination included U.S. Patent 6,605,819 of Ross, U.S. Patent 6,668,144 of Maruyama, and U.S. Patent 4,887,530 of Sainio.

Ross discloses a circular LED lighting system around an optical sensor for visual inspection of bank notes within an automated teller machine (“ATM”). Ross col. 1 ll. 5–17. Ross describes that the LEDs are lit in four separate pairs of different colored lights and the resulting diffuse reflection is recorded by the optical sensor. *Id.* fig. 1a, col. 2 ll. 13–26, col. 6 ll. 35–49. The recorded data are compared to data of genuine bills lit under those colors to determine source and denomination. *Id.* col. 2 ll. 27–34, col. 6 l. 58–col. 7 l. 22. The circular LED lighting system is depicted in Figure 1a of the Ross patent, reproduced below:



Ross fig. 1a.

Maruyama discloses an optical sensor to visually analyze and gather data from a sheet lit by an LED lighting system in a photocopier or laser printer. *E.g.*, Maruyama col. 4 ll. 30–39. Maruyama discloses that the light from the LED system is reflected at an angle to detect proper-

ties of the sheet, such as thickness. *Id.* fig. 6A, col. 6 ll. 46–59. That information is then used to adjust the printing process based on the thickness of the sheet. *Id.* col. 7 ll. 24–32.

Sainio discloses a system comprising an optical image scanner in a printing press to detect errors in the printing process. Sainio, at [57]. Sainio describes that the optical image scanner, using a high intensity light, scans printed marks to detect deviations within the marks. *Id.* col. 3 l. 67–col. 4 l. 42. The system then analyzes the deviations and generates signals to adjust the printing process and account for those deviations. *Id.* col. 6 ll. 38–44.

The examiner initially rejected all twelve of the original claims of the '423 patent as obvious over various combinations of prior art. Office Action, No. 95/000,526 (Feb. 5, 2010). Quad/Tech responded by amending claims 5, 9, and 12 and adding sixty new claims, claims 13–72, to the '423 patent. *Claim Amendments* at 4–15.

The examiner then closed prosecution and made a final rejection of all 72 claims. Action Closing Prosecution, No. 95/000,526 (June 24, 2010). She rejected claims 14 and 24 as failing to meet the written description requirement of 35 U.S.C. § 112, ¶1, on the ground that the claim requirement of “a sensor, wherein the LEDs are disposed between the sensor and the substrate of the printing press” lacked support in the original patent. *Id.* at 7. The examiner also rejected claim 18 under § 112, ¶1, on the ground that the claim contained a negative limitation requiring the “substrate of the press [to be] unsupported at the [point of illumination],” which lacked support in the original patent. *Id.* at 8.

The examiner additionally rejected claims 1–4, 7–15, 17, and 18 under 35 U.S.C. § 103(a)³ for obviousness over Maruyama in view of Ross. *Id.* at 9. Specifically, she found that Maruyama disclosed a visual inspection system for a printing press and Ross disclosed a circular LED configuration. *Id.* at 9–14. The remaining claims were rejected under § 103(a) as unpatentable over various combinations of prior art: (i) claims 5, 6, and 12 were rejected over Maruyama in view of Ross, further in view of U.S. Patent 6,691,620 of Riepenhoff; (ii) claim 16 was rejected over Maruyama in view of Ross, further in view of Admitted Prior Art; (iii) claims 19, 20, 23–25, 27, 29, 30, 33–36, and 39–47 were rejected over Maruyama in view of Ross, further in view of Sainio; (iv) claims 21, 31, and 54 were rejected over Maruyama in view of Ross, further in view of Sainio, Admitted Prior Art, and U.S. Patent 4,736,446 of Reynolds; (v) claims 22, 26, 37, 38, and 48–53 were rejected over Maruyama in view of Ross, further in view of Sainio and Admitted Prior Art; (vi) claim 28 was rejected over Maruyama in view of Ross, further in view of Sainio and U.S. Patent 5,884,073 of Dent; (vii) claim 32 was rejected over Maruyama in view of Ross, further in view of Sainio and U.S. Patent

³ On the date applicable to this case, the statute provided that:

(a) A patent may not be obtained . . . if 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 . . .

35 U.S.C. § 103(a) (2006). That provision has since been amended. *See AIA § 3(c), 125 Stat. 284, 287–88 (2011).* However, because the application that led to the '423 patent was filed before March 16, 2013, the pre-AIA § 103(a) applies. *See AIA, 125 Stat. at 293.*

5,967,050 of Seymour; and (viii) claims 55–60 were rejected over Maruyama in view of Ross, further in view of Sainio, Admitted Prior Art, Dent, and Reynolds. *Id.* at 24–51. Thus, for the obviousness rejections of claims 1–60, the examiner relied on Maruyama as the primary reference disclosing the limitations of a visual inspection system configured to work with a printing press, as required by the preambles of the respective claims. *See, e.g., id.* at 9 (“Maruyama discloses a visual inspection system . . . configured to be in optical communication with a substrate/sheet (of paper) of a printing press.”).

The examiner also rejected claims 61–64, 71, and 72 under § 103(a) as unpatentable over Sainio in view of Ross. *Id.* at 51. The examiner relied on Sainio for its disclosure of the visual inspection system configured to work with a printing press and on Ross for its disclosure of the circular LED configuration. *Id.* at 51–56. Additionally, the examiner rejected claim 65 as unpatentable over Sainio in view of Ross, further in view of Dent, and rejected claims 66–70 over Sainio in view of Ross, further in view of Dent and Admitted Prior Art. *Id.* at 56–57. Thus, for the obviousness rejections of claims 61–72, the examiner relied on Sainio as the primary reference disclosing the visual inspection system in optical communication with the substrate of a printing press, required by the claim preambles, as well as the limitation to acquire a two-dimensional image from a printing press substrate, and relied on Ross for the circular LED configuration. *Id.* at 51–57. Quad/Tech appealed the rejections to the Board.

On appeal, the Board affirmed in part and reversed in part the examiner’s rejections. Specifically, the Board reversed the rejections of claims 14 and 24 under § 112, ¶1, finding that the disclosure of an image recording device in the written description of the ’423 patent and its representations in figure 2 and 3 were sufficient to support the claim limitation of a sensor positioned between a

substrate and an image recording device. *Board Decision* at 5. The Board further reversed the obviousness rejection of claims 1–17 and 19–60, finding that neither Ross nor Maruyama suggested using a visual inspection system with LED lighting in communication with a printing press. *Id.* at 7–8. The Board reversed those rejections because it found that neither Maruyama nor Ross disclosed or suggested a printing press, finding instead that Maruyama disclosed a visual inspection system for a copier or laser printer and that Ross disclosed a system for “media recognition, validation and screening.” *Id.* at 7.

The Board did affirm the examiner’s rejection of claims 61–72, finding that they would have been obvious over the printing press of Sainio and the circular configuration of LEDs of Ross. *Id.* at 14. The Board found that Sainio disclosed a printing press that included an illumination system and that it would have been obvious to incorporate the illumination system of Ross with Sainio. *Id.* at 8–11. The Board also affirmed the rejection of claim 18 under 35 U.S.C. § 112, ¶2, finding that the figures of the ’423 patent do not disclose a substrate that is “unsupported at the point [of illumination],” rendering the claim invalid for lack of adequate written description. *Id.* at 6.

Q.I. Press appealed to this court the Board’s reversal of the examiner’s obviousness rejection of claims 1–17 and 19–60 and the written description rejection of claims 14 and 24; Quad/Tech cross-appealed the Board’s affirmation of the examiner’s rejection of claims 61–72 for obviousness and the written description rejection of claim 18. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

I. Standard of Review

We review 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 the evidence to support the finding. *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938). In PTO reexaminations, “the standard of proof—a preponderance of the evidence—is substantially lower than in a civil case’ and there is no presumption of validity in reexamination proceedings.” *In re Baxter Int’l, Inc.*, 678 F.3d 1357, 1364 (Fed. Cir. 2012) (quoting *In re Swanson*, 540 F.3d 1368, 1377 (Fed. Cir. 2008)).

II. Obviousness of Claims 61–72

We first address the cross-appeal, as it forms the backdrop for our view of the principal appeal. Quad/Tech argues that the Board erred in rejecting claims 61–72 for obviousness over Ross and Sainio by using hindsight bias to combine the two references. Quad/Tech further argues that Ross and Sainio cannot be combined because the circular lighting configuration of Ross does not teach a high intensity illumination system, but rather a way of shining individual pairs of lights. Finally, Quad/Tech argues that Q.I. Press’s statements praising the circular lighting arrangement of its own accused products provide objective evidence of nonobviousness of the ’423 patent.

Q.I. Press responds that at the time of the invention of the ’423 patent, LEDs were well known by those of skill in the art to provide efficient illumination with less heat than conventional lighting solutions. The Director responds that the combination of Sainio and Ross would have been obvious to one of skill in the art. The Director

contends that Sainio teaches a printing press, that Ross teaches a circular LED configuration, and that one of skill in the art would have combined Ross with Sainio to use multiple LEDs in the circular pattern for greater illumination.

We agree with Q.I. Press and the Director that combining Ross and Sainio would have been obvious to one having skill in the art at the time of the invention. Obviousness is a question of law, based on underlying factual findings. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Elsner*, 381 F.3d at 1127. A claim is invalid for obviousness if, to one of ordinary skill in the pertinent art, “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” 35 U.S.C. § 103(a) (2006); *see also KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406–07 (2007). “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR*, 550 U.S. at 416. In assessing this question, assessment of proffered evidence of non-obviousness must be part of the inquiry, even in the reexamination context. *Leo Pharm. Prods., Ltd. v. Rea*, 726 F.3d 1346, 1357–58 (Fed. Cir. 2013). That is the case here.

Sainio teaches a printing press incorporating a single high intensity illumination system. That illumination system is used to detect misalignments in the printing press and to adjust the system accordingly. Ross discloses a circular LED lighting configuration consisting of a plurality of LEDs surrounding an optical sensor. As the Board correctly found, it would have been obvious for one of skill in the art, in seeking alternatives to a single high intensity light, to increase the number of light sources and utilize LEDs, teachings found in Ross. Additionally, incorporating multiple light sources in a configuration that would permit a high level of multidirectional lighting

would obtain the predictable result of a greater degree of illumination. The Board thus did not err in concluding that claims 61–72 would have been obvious over Sainio in view of Ross.

Moreover, although the invention in Ross uses the circular configuration to illuminate two lights at a time, claims 61–72 of the '423 patent only require a “plurality of LEDs . . . disposed in a configuration surrounding the optical communication path” *Claim Amendments* at 13–15. Thus, the claims do not require that the illumination occur at the same time or that a specific sequence of lights be lit, but only that there is a plurality of lights in a circular configuration, which Ross discloses.

Further, Q.I. Press’s marketing statements praising the circular configuration of the LED illumination, introduced by Quad/Tech as evidence of industry praise, do not change our obviousness conclusion. Q.I. Press’s brochure does include statements about the circular LED configuration being “state-of-the-art LED lighting technology” with a “higher quality of lumen,” and that the “ring of LED lighting” was one of the “most striking design features” of that product. Joint Appendix (“J.A.”) 863. Although these objective indicia of non-obviousness are relevant to, and must be factored into our analysis, that evidence does not alter the conclusion that, upon consideration of all relevant evidence, claims 61–72 of the '423 patent were invalid as obvious over Sainio in view of Ross. The Board thus did not err in reaching that conclusion.

III. Written Description of Claim 18

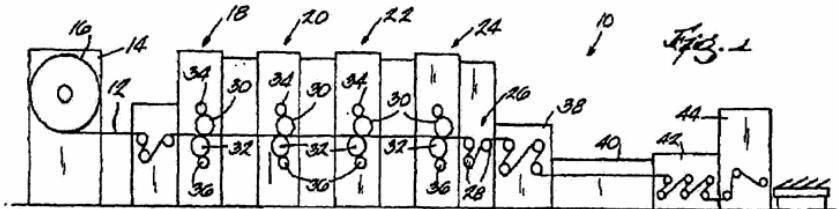
Also in the cross-appeal, Quad/Tech argues that the Board erred in concluding that claim 18 of the '423 patent was invalid for inadequate written description because, it asserts, the figures of the patent depict areas where the substrate is physically unsupported by rollers. Specifically, Quad/Tech points to figures 1 and 2 of the '423 patent

to depict where the substrate is physically unsupported at the point of illumination, as required by claim 18.

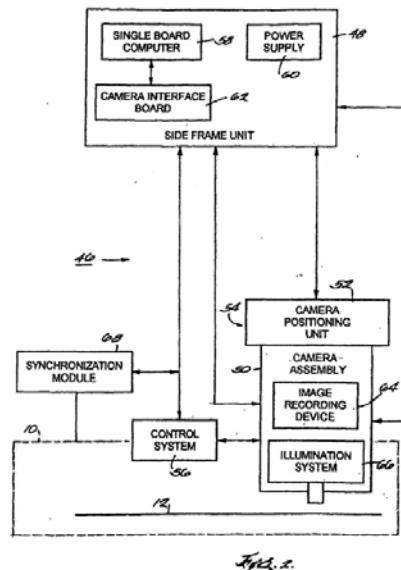
The Director responds that those figures do not depict a substrate that is physically unsupported at the point of illumination. The Director contends that figure 1, depicting the printing press, does not show where the visual inspection system is, and that figure 2 is exemplary, showing the visual inspection system but not the surrounding printing press.

We agree with the Director that the figures of the '423 patent do not show the substrate unsupported at the point of illumination as required by claim 18. Whether a claimed invention is supported by an adequate written description is a question of fact, *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc), which we review for substantial evidence, *Shu-Hui Chen v. Bouchard*, 347 F.3d 1299, 1304–05 (Fed. Cir. 2003). The written description is a statutory requirement set forth in 35 U.S.C. § 112. The test for written description is that it “must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed.” *Ariad*, 598 F.3d at 1351 (citation and quotations omitted). The disclosure must “convey[] to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Id.*

As the Board found, the written description of the '423 patent does not show a substrate unsupported at the point of illumination. *Board Decision* at 6. Figure 1, below, shows an unsupported substrate (12), but does not indicate where in the figure the illumination system would be. Figure 2, on the other hand, shows the illumination system (66) and the substrate (12) but does not depict any of the printing press hardware.



'423 patent fig. 1.



Id. fig. 2.

Although the substrate in figure 2 appears to be unsupported at the point of illumination, the Board found that the depiction of the substrate was inadequate. In figure 2, the depicted substrate is “floating,” without any reference or additional illustration of the roller hardware of the printing press. Without this information, the figure does not “clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed.” *Ariad*, 598 F.3d at 1351 (citation and quotations omitted).

The '423 patent also recognizes that figure 2 does not depict the surrounding printing press hardware. The written description relevant to figure 2 describes it as "a block diagram of a *visual inspection system*," '423 patent col. 2 ll. 37–38 (emphasis added), not as a depiction of the printing press invention as a whole. Substantial evidence thus supports the Board's conclusion that claim 18 is invalid due to an inadequate written description because the written description does not disclose a physically unsupported substrate at the point of illumination.

IV. Obviousness of Claims 1–60

In the principal appeal, Q.I. Press argues that the Board erred in concluding that claims 1–60 would not have been obvious over Maruyama in view of Ross. Q.I. Press asserts that the Board's decision is inherently contradictory, finding that claims 1–60 would not have been obvious because Maruyama and Ross do not disclose a printing press, but also finding that the similar claims 61–72 would have been obvious over a combination of the printing press in Sainio and Ross. Q.I. Press also argues that the Board erred in reversing the rejection of claims 13–60 because those claims, added during the reexamination, improperly expanded the scope of the '423 patent in violation of 35 U.S.C. § 305.

Quad/Tech responds that the Board was correct in concluding that Maruyama and Ross would not have rendered claims 1–60 obvious. Quad/Tech contends that the printing press is a limitation of claims 1–60 and that although it appears in the preamble of some of the independent claims, later limitations require the preamble printing press disclosure to provide antecedent basis. Quad/Tech thus asserts that the combination of Maruyama and Ross would not have rendered the claims obvious because Maruyama does not disclose a printing press. Quad/Tech additionally argues that Q.I. Press has waived the argument that claims 13–60 expanded the scope of the

'423 patent because Q.I. Press failed to present it to the Board. The Director also asserts that the combination of Maruyama and Ross would not have rendered claims 1–60 obvious because it is undisputed that neither Maruyama nor Ross discloses a printing press.

Concerning the argument that the Board erred in reversing the rejection of claims 13–60 because those claims improperly expand the scope of the '423 patent in violation of 35 U.S.C. § 305, we agree with Quad/Tech that the argument was not presented before the Board and is thus waived. *See In re Baxter Int'l, Inc.*, 678 F.3d 1357, 1362 (Fed. Cir. 2012) (“Absent exceptional circumstances . . . we generally do not consider arguments that the applicant failed to present to the Board.” (citing *In re Watts*, 354 F.3d 1362, 1367–68 (Fed. Cir. 2004)).

Regarding the obviousness of claims 1–60, however, those claims differ only slightly from claims 61–72, the rejection of which we have above affirmed. Taking claim 1 and claim 61 as representative, both claims begin with a nearly identical preamble and include an image recording device, a processing unit, and an illumination system. *Compare Claim Amendments* at 13–14 with '423 patent col. 9 ll. 45–56. The only meaningful differences between the claims are: (i) the image recording device of claim 61 acquires an image “from a substrate on a printing press,” *Claim Amendments* at 14, whereas the image recording device of claim 1 records “images printed on the substrate,” '423 patent col. 9 ll. 48–50; (ii) the illumination system of claim 61 surrounds the optical image recording device and is adapted to illuminate the printing press substrate, *Claim Amendments* at 14, whereas the illumination system of claim 1 is in a circular configuration, '423 patent col. 9 ll. 53–56; and (iii) the processing unit of claim 61 is configured to process the recorded image, *Claim Amendments* at 14, whereas the processing unit of claim 1 is configured to generate an output, '423 patent col. 9 ll. 50–52.

The examiner rejected claims 1–60 over combinations of Maruyama and Ross, finding that Maruyama disclosed a visual inspection system for a printing press and that Ross disclosed a circular LED illumination configuration. The examiner rejected claims 61–72 over combinations of Sainio and Ross for similar reasons; she relied on Sainio for its disclosure of the visual inspection system configured to work with a printing press and on Ross for the circular LED configuration. Given the minor differences in the claims themselves and similarities in the cited prior art, it seems apparent that the combination of Sainio and Ross discloses many of the elements of claims 1–60.

We are cognizant of the fact that the Board perhaps did not *sua sponte* reject claims 1–60 for obviousness over Sainio in view of Ross because that rejection would have constituted a new ground for rejection on appeal. *See Rambus Inc. v. Rea*, 731 F.3d 1248, 1255 (Fed. Cir. 2013) (“The Board may not ‘rel[y] on new facts and rationales not previously raised to the applicant by the examiner.’” (quoting *In re Leithem*, 661 F.3d 1316, 1319 (Fed. Cir. 2011)); *see also Leithem*, 661 F.3d at 1319 (stating that even “reliance on the same statutory basis and the same prior art references, alone, is insufficient to avoid making a new ground of rejection when the Board relies on new facts and rationales not previously raised to the applicant by the examiner”).

However, the Board has the discretion to issue a new ground of rejection if it has knowledge of one. 37 C.F.R. § 41.77(b) (“[S]hould the Board have knowledge of any grounds not raised in the appeal for rejecting any pending claim, it may include in its opinion a statement to that effect with its reasons for so holding, which statement shall constitute a new ground of rejection of the claim.”). In those instances, the “Board must designate its decision a new ground of rejection and provide the appellant with an opportunity to respond.” *Rambus*, 731 F.3d at 1256

(citing *In re Stepan Co.*, 660 F.3d 1341, 1344 (Fed. Cir. 2011); 37 C.F.R. § 41.77(b)); *see also Stepan*, 660 F.3d at 1343 (“[I]f the appellant has not had a full and fair opportunity to litigate the Board’s actual basis of rejection, the administrative validity proceedings before the [PTO] should be allowed to continue.” (citing *In re Kumar*, 418 F.3d 1361, 1367–68 (Fed. Cir. 2005)). If a new ground of rejection is included in the opinion, the patentee then has the option to either reopen prosecution before the examiner or request rehearing. 37 C.F.R. § 41.77(b).

Here, when all these references were before the Board, and this court, an obligation is owed to the public not to permit inconsistent results when a proper challenge to that inconsistency is made on appeal. The Board should have observed the similarities between the claims, noted those similarities between the claims and the references before the Board on appeal, analyzed whether the combination of Sainio and Ross would have rendered claims 1–60 obvious, and if so, issued a new ground of rejection. The combination of Sainio and Ross was before the Board on appeal because those references were cited by the examiner to invalidate claims 61–72. And, given the minor differences between the claims, the Board “[had] knowledge of . . . grounds not raised in the appeal for rejecting [claims 1–60].” *Id.* We do not hold that the Board should always apply references that are before it affecting some claims to every other claim on appeal, but we do find that in this instance, in which nearly identical claims were found both valid and invalid due to similar combinations of prior art resulting in a Board opinion that was seemingly inconsistent, the Board erred by not considering the combination of Sainio and Ross as a new ground for rejection of claims 1–60. Accordingly, we vacate the Board’s decision to the extent that it holds that claims 1–60 would not have been obvious and remand that portion of the case for further proceedings consistent with this opinion.

V. Written Description of Claims 14 and 24

Q.I. Press argues in the principal appeal that the Board erred in reversing the written description rejection of claims 14 and 24 because the written description of the '423 patent does not disclose a “sensor” that is above the LEDs and the printing press substrate. Q.I. Press contends that the Board relied on the image recording device depicted in figure 3 for the sensor required in claims 14 and 24, but that the written description provides no guidance to show where in the image recording device that sensor is housed.

Quad/Tech and the Director respond that the position of the LEDs is shown in figure 2, which shows the illumination system (LEDs) disposed between the image recording device (sensor) and the substrate. They further contend that figure 3 shows the LEDs arranged around the lens of the camera and above the housing. Quad/Tech and the Director also respond that a person of ordinary skill would have understood the sensor to be in the housing and thus that the LEDs would be between the substrate and the sensor.

We agree with Quad/Tech and the Director that claims 14 and 24 are not invalid for inadequate written description because the figures of the '423 patent show the illumination system disposed between the image recording device and the substrate. First, regarding Q.I. Press's argument that the '423 patent does not disclose a “sensor,” we agree with the Board that the image recording device would include a sensor. *See Board Decision* at 5 (“[T]he Specification discloses an . . . ‘image recording device’ (i.e., ‘sensor’) (e.g., Fig. 2, element 64).”). An image recording device necessarily includes a sensor to capture the image, and that sensor is contained within the recording device.

Additionally, the figures of the '423 patent clearly show the illumination system disposed between the

sensor and the substrate. Figure 2 of the '423 patent, reproduced below, depicts the illumination system (66) disposed between the image recording device (64) and the substrate (12), supporting the requirements of claims 14 and 24.

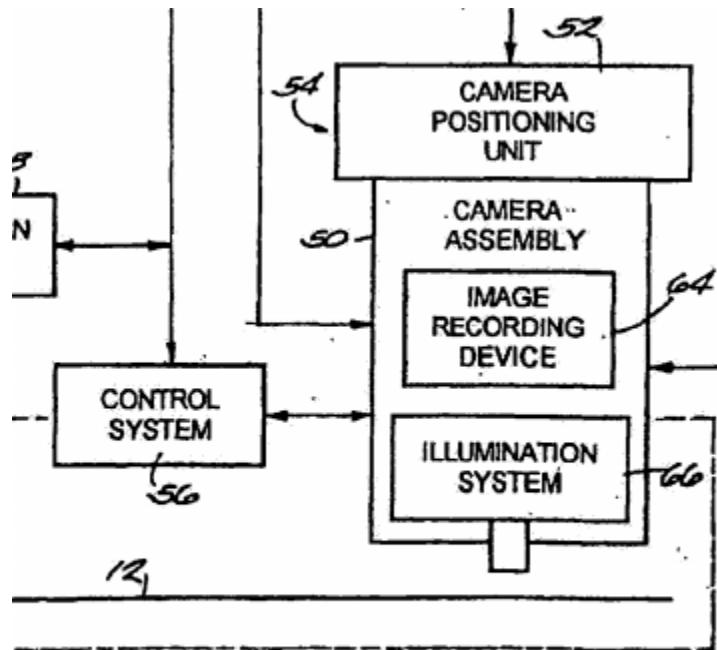
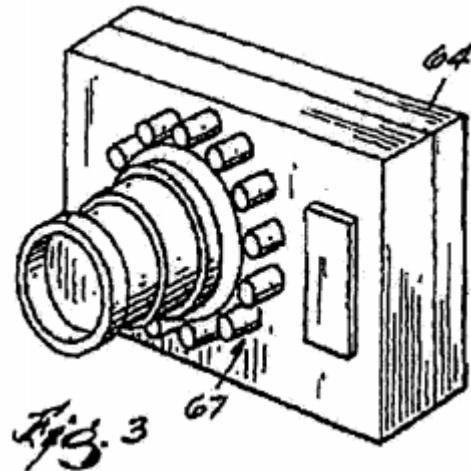


Fig. 2.

'423 patent fig. 2.

Figure 3 of the '423 patent, reproduced below, depicts the LED light array (67) as configured above the image recording device (64) in the direction of the image being recorded, here the substrate. Although the substrate is not shown in that figure, the lens of the image recording device necessarily points towards the substrate, and clearly shows that the LEDs are between the object being recorded (the substrate) and the image recording device (64).



'423 patent fig. 3. The Board's conclusion that claims 14 and 24 are not invalid for inadequate written description is thus supported by substantial evidence.

CONCLUSION

For the foregoing reasons, the decision of the Board holding claims 61–72 invalid under § 103, claim 18 invalid for failing to meet the written description requirement under § 112, and claims 14 and 24 to have met the written description requirement under § 112 is affirmed, and the decision of the Board upholding the validity of claims 1–60 under § 103 is vacated and remanded.

**AFFIRMED IN PART, VACATED IN PART, AND
REMANDED**