

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* CHRISTOPHER A. WHITMAN, KEVIN J. MATHERSON,  
ROBERT E. SOBOL, and DAVID KAY CAMPBELL

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Appeal 2008-2282  
Application 10/174,970  
Technology Center 2600

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Decided: September 8, 2008

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Before KENNETH W. HAIRSTON, JOHN A. JEFFERY, and  
CARLA M. KRIVAK, *Administrative Patent Judges*.

KRIVAK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from a final rejection of claims 1-30 and 34-36.<sup>1</sup> We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

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<sup>1</sup> The Examiner objected to claims 31-33 and noted that these claims would be allowable if rewritten in independent form (Final Office Action mailed Oct. 18, 2006, at 9).

## STATEMENT OF CASE

Appellants' claimed invention is a method and system for correcting color-dependent vignetting in a digital camera (cl. 1; Spec. ¶ [0001]). The method and system include a raw array of data for each color a camera can image, a number of vignetting correction schemes, selecting a vignetting correction scheme based upon determined values of operating parameters, and adjusting the raw arrays according to the selected correction scheme so that the array for each color exhibits the same amount of vignetting for reducing color-dependent vignetting in a composite image based upon each of the arrays (cls. 1, 15, 30). This allows a digital camera to remove color-dependent vignetting without, or while also removing non-color vignetting (¶ [0017]). Also, less costly systems can be used, color-dependent vignetting can be corrected in real time, and moderate cost digital cameras can achieve color-dependent vignetting (Spec. ¶¶ [0057-0062]).

Independent claim 1, reproduced below, is representative of the subject matter on appeal.

1. A method or correcting color-dependent vignetting in a digital camera, the method comprising:

providing a raw array of data corresponding to an image of a scene for each color that said camera can image; and

providing a plurality of candidate vignetting correction schemes;

determining values of operating parameters to which parameters of the camera were adjusted when the respective raw arrays were captured;

selecting a vignetting correction scheme from among the plurality of candidates based upon the determined values; and

adjusting the raw arrays according to the selected scheme such that the array for each color exhibits substantially the same amount of vignetting so as to reduce color-dependent vignetting in a composite image based upon each of the adjusted arrays.

REFERENCES

Easton	US 4,899,294	Feb. 6, 1990
de Groot	US 5,381,174	Jan. 10, 1995
Nomami	US 5,764,809	Jun. 9, 1998
Matsui	US 6,091,445	Jul. 18, 2000
Tamura	US 6,707,500 B1	Mar 16, 2004 (filed Mar. 12, 1996)
Niikawa	US 7,075,569 B2	Jul. 11, 2006 (filed Mar. 19, 2002)

Claims 1, 2, 13-16, 27-30, and 34-36 stand rejected under 35 U.S.C. § 103(a) based upon the teachings of de Groot and Niikawa.

Claims 3, 4, 17, and 18 stand rejected under 35 U.S.C. § 103(a) based upon the teachings of de Groot, Niikawa, and Matsui.

Claims 5-9 and 19-23 stand rejected under 35 U.S.C. § 103(a) based upon the teachings of de Groot, Niikawa, and Tamura.

Claims 10, 12, 24, and 26 stand rejected under 35 U.S.C. § 103(a) based upon the teachings of de Groot, Niikawa, Tamura, and Nomami.

Claims 11 and 25 stand rejected under 35 U.S.C. § 103(a) based upon the teachings of de Groot, Niikawa, Tamura, Nomami, and Easton.

Appellants contend it would not be obvious to adapt de Groot according to Niikawa (Br. 7).

## ISSUES

Did the Examiner err in rejecting claims 1, 2, 13-16, 27-30, and 34-36 under 35 U.S.C. § 103(a) as obvious over de Groot and Niikawa?

Did the Examiner err in rejecting claims 3, 4, 17, and 18 under 35 U.S.C. § 103(a) as obvious over de Groot, Niikawa and Matsui?

Did the Examiner err in rejecting claims 5-9 and 19-23 under 35 U.S.C. § 103(a) as obvious over de Groot, Niikawa, and Tamura?

Did the Examiner err in rejecting claims 10, 12, 24, and 26 under 35 U.S.C. § 103(a) as obvious over de Groot, Niikawa, Tamura, and Nomami?

Did the Examiner err in rejecting claims 11 and 25 under 35 U.S.C. § 103(a) as obvious over de Groot, Niikawa, Tamura, Nomami, and Easton?

## FINDINGS OF FACT

1. Appellants' invention teaches correcting color-dependent vignetting in a digital camera where an array of raw data corresponding to an image is provided for each color that the camera can image (cl. 1). Operating parameters are determined and adjusted when the raw arrays are captured. A vignette correction scheme is selected based on the operating parameters. Finally, the raw arrays are adjusted according to the selected scheme such that the "array for each color exhibits substantially the same amount of vignetting" based upon the adjusted arrays (cl. 1).

2. De Groot teaches correcting vignetting in an upper or lower range of a pick up area in a color television. The device is an analog device. Each video signal processing circuit 11, 12, 13 (Fig. 1) includes a controllable amplifier whose degree of amplification is changed by control signals KR, KG, and KB at the control inputs. The control signals are generated in adder

stages 17, 18, and 19, respectively, where “different correction signals K1, K2, K3 caused, for example by different vignettings, are combined” (col. 2, ll. 50-56).

3. Niikawa teaches a digital camera including a plurality of correction tables for use in shading correction. First and second images are acquired and multiplication from one correction table is performed on both images by a shading correction circuit. Thus, shading correction is effected on both images. The images are then taken into respective image memories, subjected to a positioning process, and synthesized to generate a synthesized image (Abstract).

#### PRINCIPLES OF LAW

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). “[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability.” *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). If the Examiner’s burden is met, the burden then shifts to the Appellants to overcome the *prima facie* case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

It should be noted that “[r]ejections 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." *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

## ANALYSIS

The Examiner rejected claims 1, 2, 13-16, 27-30, and 34-36 as obvious over de Groot and Niikawa. We address this rejection with respect to representative claim 1.<sup>2</sup> Turning to the rejection, the Examiner indicates how the claimed invention is deemed to be fully met by the disclosure of de Groot and Niikawa. The Examiner contends that de Groot teaches all the features of the claimed invention except that de Groot teaches vignetting correction for analog signals in an analog camera. Further, de Groot does not teach a “plurality of candidate vignettings correction schemes are provided, and that vignettings correction schemes are selected according to operating parameters determined when the raw arrays” are captured (Ans. 3). The Examiner further states that Niikawa teaches a digital camera with vignetting correction via a shading circuit and that the values of operating parameters such as focal length and f-number are used to select a vignetting correction scheme from among a plurality of candidates (Ans. 3). Thus, it would have been obvious to combine de Groot and Niikawa to incorporate color-dependent vignetting correction of de Groot using the correction tables of Niikawa (Ans. 4).

Appellants assert that Niikawa teaches synthesizing an image using two images of a common subject captured at different points in time (col. 5, ll. 15-22; Br. 8). Positioning/registering of the two images is required prior to synthesis (Br. 8). Shading is taken into consideration to achieve accurate

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<sup>2</sup> Appellants state that claims 1-30 and 34-36 stand or fall together as one group (Br. 7).

positioning/registering. However, the shading taught by Niikawa is non color-dependent. That is, it is not color specific as is Appellants' claimed invention. Although Niikawa teaches white balance correction, nowhere does Niikawa specifically refer to "correcting vignetting in a manner specific to the image data of each of the three color components R, G and B" (Br. 8). We agree.

First, de Groot teaches combining different correction signals caused by different vignettings using various amplifiers and adder stages (col. 2, ll. 50-57). Further, de Groot provides neither a plurality of vignetting correction schemes nor adjusting each array for each color so that each array exhibits substantially the same amount of vignetting to reduce color-dependent vignetting, as does Appellants' claim 1. Niikawa does teach a correction table for different parameters that include optical conditions, such as focal length and f-number, however, it is to allow a shading correction circuit to perform shading correction of every pixel or pixel block (col. 8, ll. 16-36). Niikawa also teaches a WB circuit but it only adjusts a white balance of an image by converting the level of image data of each color component R, G, B using a level conversion table (col. 8, ll. 46-54). There is no reference to color-specific vignetting correction in Niikawa. The only time Niikawa mentions color components as possibly being used is when Niikawa refers to the positioning process in which only the G color component is employed because the R and B color components "exert a little influence on the resolution" (col. 13, ll. 12-19). Niikawa states, "it is impossible to effect accurate positioning without taking such an influence of shading" (col. 5, ll. 22-24). Thus, the "Examiner *believes* (emphasis added) that Niikawa teaches vignetting correction for each color component during the shading correction process" (Ans. 10). Nowhere, however, does Niikawa state or imply the shading

process involves vignetting correction for each color component array; the Examiner has merely provided a conclusory statement alleging it is so.

Thus, combining de Groot, which teaches an analog system having no vignetting correction schemes, no selection of a vignetting correction scheme based on determined values, and no adjusting of raw arrays according to the selected vignetting correction scheme such that the array for each color exhibits the same amount of vignetting to reduce color-dependent vignetting of the adjusted arrays, with Niikawa, which does not teach vignetting correction for each color array, as alleged by the Examiner, would not result in the correcting scheme recited in Appellants' claim 1. Therefore, we reverse the Examiner's rejection of independent claim 1, and independent claims 15, 29, and 30 which recite commensurate limitations. Accordingly, we will not sustain the Examiner's rejection of these claims or dependent claims 2, 13, 14, 16, 27, 28, and 34-36 for similar reasons.

Appellants provide no additional arguments with respect to the other references cited against claims 3-12 and 17-26, stating none of the additional references resolves the failings of de Groot and Niikawa (Br. 10). We agree. Therefore, we also reverse the rejections of claims 3-12 and 17-26.

## CONCLUSION

We therefore conclude that the Examiner erred in rejecting claims 1-30 and 34-36 under 35 U.S.C. § 103(a).

Appeal 2008-2282  
Application 10/174,979

DECISION

We reverse the decision of the Examiner rejecting claims 1-30 and 34-36.

REVERSED

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