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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TERJE K. BACKMAN and MICHAEL AKSIONKIN

Appeal 2019-002945
Application 13/709,911
Technology Center 2400

Before CARL W. WHITEHEAD JR., DAVID M. KOHUT, and
IRVIN E. BRANCH, *Administrative Patent Judges*.

KOHUT, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–14 and 17–20.² We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ We use “Appellant” to reference the applicant as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as “Microsoft Technology Licensing, LLC.” Appeal Br. 3.

² Claims 15 and 16 were previously cancelled.

STATEMENT OF THE CASE

Appellant's Invention

Appellant's invention is a "hyperspectral imager includ[ing] a sensor array and a filter array." Spec., Abst. Independent claim 1, reproduced below, is illustrative of argued subject matter.

1. A depth-imaging color camera comprising:

a radiant-energy source emitting toward a subject in an invisible wavelength band;

a filter array comprising plural side-by-side groupings of filter elements, each filter element transmitting radiant energy of a different wavelength band and rejecting radiant energy outside of that band, each side-by-side grouping of filter elements including a first, second, third, and fourth kind of filter element, the wavelength band of the first kind of filter element being invisible and those of the second, third and fourth kinds being visible;

a sensor array of individually addressable, radiant-energy responsive sensor elements arranged side-by-side, behind the filter array, the sensor array including, for each side-by-side grouping of filter elements, a corresponding side-by-side grouping of first, second, third, and fourth sensor elements, wherein the first sensor element is aligned with the first kind of filter element, the second sensor element is aligned with the second kind of filter element, the third sensor element is aligned with the third kind of filter element, and the fourth sensor element is aligned with the fourth kind of filter element; and

a logic machine configured to, for each subject locus imaged at a corresponding side-by-side grouping of sensor elements, compute depth to the subject locus by addressing the first sensor element of the side-by-side grouping, and compute color of the locus by addressing the second, third, and fourth sensor elements of the side-by-side grouping.

Appeal Br., Claims Appendix.

Rejections

Claims 1, 3, 5, 13, 17, and 20 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Wu (US 2012/0087645 A1; Apr. 12, 2012) and Kim (US 2014/0078459 A1; Mar. 20, 2014). Non-Final Act. 10–13.

Claims 4, 14, 18, and 19 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Wu, Kim, and Olsen (US 2006/0054782 A1; Mar. 16, 2006). Non-Final Act. 13–16.

Claim 2 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Wu, Kim, and Parker (US 5268734; Dec. 7, 1993). Non-Final Act. 16–18.

Claims 6–9, 11, and 12 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Wu, Kim, and Banjanin (US 2013/0245428 A1; Sept. 19, 2013). Non-Final Act. 18–21.

Claim 10 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Wu, Kim, Banjanin, and Olsen. Non-Final Act. 22.

OPINION

For the following reasons, we are unpersuaded of error in the rejections of claims 1–14 and 17–20.

35 U.S.C. § 103(a) rejection over Wu and Kim

We select claim 1 as representative of the group comprising claims 1, 3, 5, 13, 17, and 20 because Appellant has not argued any of the other claims with particularity. Claim 1 recites in pertinent part:

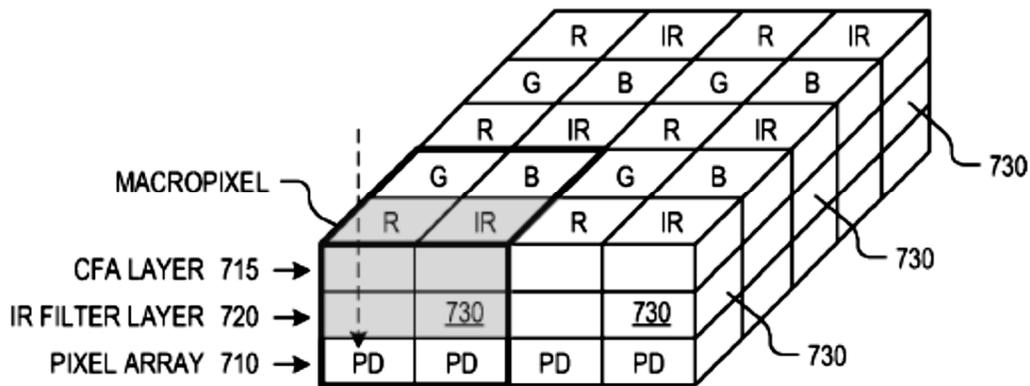
a filter array comprising plural side-by-side groupings of filter elements, each filter element transmitting radiant energy of a different wavelength band and rejecting radiant energy outside of that band, each side-by-side grouping of filter elements including a first, second, third, and fourth kind of filter element, the wavelength band of the first kind of filter element being

invisible and those of the second, third and fourth kinds being visible;

Appeal Br., Claims Appendix.

Appellant argues that the Examiner erred in finding Wu teaches a “side-by-side grouping of [visible-light and infrared-light] transmitting filter elements.” Appeal Br. 14 (summary of arguments); *see also id.* at 11–14 (specific arguments); Ans. 24–27 (applying Wu). We disagree with Appellant.

We agree with the Examiner that Wu’s Figure 7B, reproduced below with an added annotation (grayscale shading), teaches claim 1’s above filter array. Ans. 24–27 (reliance on Wu’s below-described bandpassing of visible light and infrared light).



“[Wu’s] FIG. 7 is a perspective view of an image sensor including a multi layered optical filter array, in accordance with an embodiment of the invention.” Wu ¶ 14.

As shown, Wu’s optical filter 104 (not labeled in the figure) comprises a color filter array (CFA) layer 715 and infrared filter array (IRFA) layer 720. Wu ¶¶ 24–27 (optical filter 104), 38–39 (CFA layer 715 and IRFA layer 720). Light is passed downward through the filter layers

715, 720 to the underlying sensors of the pixel array layer 710. *Id.* ¶¶ 21, 38–39; Fig. 7B (downward arrows). The red R, green G, blue B, and infrared IR regions of the filter layers 715, 720 respectively overlie the red R, green G, blue B, and infrared IR sensors of the pixel array layer 710. *Id.* The CFA layer 715 passes light (i.e., passes those wavelengths and blocks other wavelengths) as follows: passes red, green, and blue wavelengths respectively through the red R, green G, and blue B regions; and passes all wavelengths through the infrared IR regions. *Id.* ¶¶ 22 (“transmission window 202”), 38. The IRFA layer 720 passes light as follows: passes all visible light wavelengths through each of the red R, green G, and blue B regions; and passes a band of infrared light (e.g., wavelengths of 925 nm to 975 nm) through the infrared IR regions 730. *Id.* ¶¶ 22 (“transmission window 204”), 39 (“[P]ortions 730 may be band pass filters or cut filters that pass specific infrared wavelengths. The remaining portions . . . block all . . . infrared wavelengths while passing all . . . visible wavelengths.”); *see also* Ans. 27 (applying Wu’s paragraph 39). By the above configuration, the ***filter layers 715, 720 collectively*** pass (i.e., the optical filter 104 passes) red, green, blue, and infrared light respectively through the red R, green G, blue B, and infrared IR regions. Wu ¶¶ 22, 41.

The Examiner finds that each of the red R, green G, blue B, and infrared IR regions of the optical filter 104 (i.e., each comprises both filter layers 715, 720) constitutes a “filter element” as claimed. Ans. 27. With regard to our description of Wu’s above-reproduced Figure 7, the grayscale shading denotes such a red-region R “filter element” formed by the filter layers 715, 720 (i.e., the two leftward blocks under the shaded

“R” label). Similarly, the grayscale shading also denotes such an infrared-region IR “filter element” formed by the filter layers 715, 720 (i.e., the two rightward blocks under the shaded “IR” label). Therefore, we agree with the Examiner that Wu’s above-described optical filter 104 is a filter array comprising filter elements as claimed. Ans. 24–27.

Appellant’s arguments principally concern Wu but do not address the Examiner’s above reliance on Wu. Appeal Br. 11, 14; Reply Br. 2–5. For example, Appellant contends the infrared IR region of Wu’s CFA layer 715 passes all wavelengths of light, accordingly does not reject (i.e., block) any visible wavelengths of light, and therefore cannot teach the claimed “first kind of filter element.” Appeal Br. 11–12. This contention fails to consider that each infrared IR region of Wu’s optical filter 104 (each such region comprised of both filter layers 715, 720) rejects all wavelengths of light that do not fall within the targeted (i.e., passed) band of infrared light (e.g., wavelengths of 925 nm to 975 nm). *Id.* ¶¶ 22, 39.

Appellant further contends the claimed “side-by-side grouping of filter elements” constitutes a single filter layer, such that the filter elements present only two interfaces for light to cross (before reaching a light sensor) and thereby distinguish over Wu’s above filter regions of Wu’s optical filter 104. Reply Br. 2; Appeal Br. 12. Appellant does not provide a reason why, nor does Appellant provide sufficient evidence that, the claimed “side-by-side grouping of filter elements” would be understood by a person of ordinary skill in the art as constituting a single filter layer. Appellant thus fails to meet the burden of production for raising this argument. *See e.g., In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (affirming the prior art rejection because the appellant “merely argued that the claims differed from

[the prior art], and chose not to proffer a serious explanation of this difference.”); *In re Baxter Travenol Labs.*, 952 F.2d 388, 391 (Fed. Cir. 1991) (“It is not the function of this court to examine the claims in greater detail than argued by an appellant, looking for nonobvious distinctions over the prior art.”).

Appellant also argues that Wu does not disclose “depth imaging.” Appeal Br. 11, 14. However, the Examiner finds that Kim, not Wu, teaches this limitation. *See e.g.*, Ans. 28. Furthermore, Appellant does not provide a description of “depth-imaging” for our consideration. *See Jung*, 637 F.3d at 1365 (above parenthetical); *Baxter*, 952 F.2d at 391 (above parenthetical).

Appellant also argues that the rejection blends unrelated embodiments of Wu. Appeal Br. 13–14. We are unpersuaded because Wu’s applied embodiment of Figure 7B, by passing infrared light through the infrared IR regions and blocking all infrared light at the visible-light regions R, G, B (Wu ¶¶ 39, 41), bandpasses the red, green, blue, and infrared wavelength bands taught by Wu with reference to Figure 6 and the two wavelength bands taught by Wu with reference to Figures 2 and 4. Further, we find that Wu’s applied embodiment of Figure 7B includes the CFA layer 715 taught by Wu with reference to Figure 7A. In short, Wu’s relied-upon teachings are features of the applied embodiment.

For the foregoing reasons, we are unpersuaded by the above arguments. We accordingly sustain the rejection of claim 1 and claims 3, 5, 13, 17, and 20 that were grouped with claim 1.

35 U.S.C. § 103(a) rejection over Wu, Kim, and Olsen

Appellant makes the same arguments with respect to claims 4, 14, 18, and 19 as with claims 1 and 13. *See* Appeal Br. 15; Reply Br. 5–6. As such, we sustain the Examiner’s rejection of these claims for the same reasons as indicated *supra*.

35 U.S.C. § 103(a) rejection over Wu, Kim, and Parker

Appellant makes the same arguments with respect to claim 2 as with claims 1 and 13. *See* Appeal Br. 16; Reply Br. 5. As such, we sustain the Examiner’s rejection of this claim for the same reasons as indicated *supra*.

35 U.S.C. § 103(a) rejection over Wu, Kim, and Banjanin

Appellant makes the same arguments with respect to claims 6–9, 11, and 12 as with claims 1 and 13. *See* Appeal Br. 16–17; Reply Br. 6. As such, we sustain the Examiner’s rejection of this claim for the same reasons as indicated *supra*.

35 U.S.C. § 103(a) rejection over Wu, Kim, Banjanin, and Olsen

Appellant makes the same arguments with respect to claim 10 as with claims 1 and 13. *See* Appeal Br. 17–18. As such, we sustain the Examiner’s rejection of this claim for the same reasons as indicated *supra*.

OVERALL CONCLUSION

We affirm the Examiner’s decision to reject claims 1–14 and 17–20.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference/s	Affirmed	Reversed
1, 3, 5, 13, 17, 20	103	Wu, Kim	1, 3, 5, 13, 17, 20	
4, 14, 18, 19	103	Wu, Kim, Olsen	4, 14, 18, 19	
2	103	Wu, Kim, Parker	2	
6–9, 11, 12	103	Wu, Kim, Banjanin	6–9, 11, 12	
10	103	Wu, Kim, Banjanin, Olsen	10	
Overall Outcome			1–14, 17–20	

AFFIRMED