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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte AMMON SILVERSTEIN

Appeal 2011-009949
Application 11/739,010
Technology Center 2600

Before THU A. DANG, JAMES R. HUGHES, and GREGORY J. GONSALVES, *Administrative Patent Judges*.

DANG, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134(a) from a Final Rejection of claims 1-3, 5, 7-12, 17, 19-21, 25, 27-29, and 36. Claims 4, 6, 13-16, 18, 22-24, 26, and 30-35 have been canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

A. INVENTION

According to Appellant, the invention is related to adjusting the outputted signals of imaging pixels according to their geographic location in a pixel array to compensate for various optical problems (Spec. 1, ¶ [0001]).

B. ILLUSTRATIVE CLAIMS

Claims 1 and 7 are exemplary:

> 1. An imaging device, comprising:
>
> a pixel array comprising imaging pixels in which pixels located farther from an optical axis of the pixel array have a larger photosensitive area than a photosensitive area of pixels located closer to the optical axis of the pixel array, wherein the photosensitive area of the pixels increases with distance from the optical axis according to a two dimensional radial Gaussian normal distribution curve.
>
> 7. An imaging device, comprising:
>
> a pixel array comprising imaging pixels in which pixels located farther from an optical axis of the pixel array have a larger photosensitive area than a photosensitive area of pixels located closer to the optical axis of the pixel array,

wherein the pixel array has an x-axis and a y-axis, and

wherein a length of a side of the pixels parallel to the x-axis increases according to the distance of the pixels from the y-axis and a length of a side of the pixels parallel to the y-axis remains constant for all pixels of the pixel array.

C. REJECTION

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Stavely	US 7,227,573 B2	Jun. 05, 2007 (filed Jul. 29, 2002)
Yonemoto	US 6,980,244 B1	Dec. 27, 2005
Tullis	US 6,563,101 Bl	May 13, 2003

Claims 1-3, 5, 7-12, 17, 19, 20, 25, and 27-29 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Stavely.

Claim 21 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Stavely in view of Yonemoto.

Claim 36 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Tullis in view of Stavely.

II. ISSUES

The dispositive issues before us are whether the Examiner has erred in finding that Stavely teaches that:

1) "the photosensitive area of the pixels increases with distance from the optical axis according to a *two dimensional radial Gaussian normal distribution curve*" (claim 1 (emphasis added)); and

2) "a length of a side of the pixels parallel to the x-axis increases according to the distance of the pixels from the y-axis and the length of a

side of the pixels parallel to the y-axis *remains constant for all pixels* of the pixel array" (claim 7 (emphasis added)).

III. FINDINGS OF FACT

The following Findings of Fact (FF) are shown by a preponderance of the evidence.

Stavely

1. Stavely discloses digitizing an optical image using an array of imaging sensors (sensor array) having a non-uniform pixel layout in which the size of the imaging sensors increases from the center of the sensor array to its perimeter (col. 2, ll. 23-30), and thus, since the imaging sensors near the edges of the sensor array are greater in area than those near the center, they have greater light-gathering power than those near the center (col. 4, ll. 63-67).

2. The pixel layouts can be non-regular and/or non-rectilinear, wherein Stavely's Fig. 2B is reproduced below:

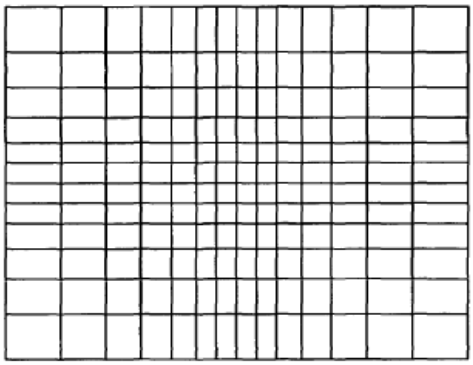

FIG. 2B

In Fig. 2B, the pixel layout places sufficient resolution near the center of the resulting digital image where it is most needed for digital zooming (col. 3, ll. 46-50).

IV. ANALYSIS

Claims 1-3, 5, 11, 12, 17, 19, 20, 25, and 27-29

As to claim 1, the Examiner points out that Appellant's Specification contains no definitions for a two dimensional radial Gaussian normal distribution curve (Ans. 10), and thus, claim 1 is not distinguished from Stavely's Figs. 2A and 2B which show "the pixels increase in size from the center" (Ans. 4). However, Appellant contends that "Stavely makes no mention whatsoever regarding a Gaussian normal distribution curve" (App. Br. 8). Thus, Appellant argues that "Stavely does not disclose that a photosensitive area of the pixels increases with distance from the optical axis according to a two dimensional radial symmetrical bell-shaped curve of a normal distribution" (App. Br. 9). According to Appellant, "the definition of Gaussian normal distribution curve adopted by the Examiner, i.e., 'pixels increasing in size from the x or y axis,' is contrary to and inconsistent with the ordinary meaning of the term" (App. Br. 10).

Upon review of the record, we agree with Appellant. In particular, we do not find any teaching of photosensitive areas increasing from the optical axis "according to a two dimensional radial Gaussian normal distribution curve" (claim 1) in the portions of Stavely relied upon by the Examiner. In fact, we do not find any teaching of photosensitive areas increasing according to any normal curve.

Stavely discloses increasing the size of the imaging sensors from the center of the sensor array, wherein imaging sensors at the edges have greater light-gathering power than those near the center (FF 1). Thus, we find that Stavely does teach increasing the photosensitive areas of the pixels from the optical axis. Though we give the claims their broadest reasonable interpretation, we agree with Appellant that mere teaching of "pixels increasing in size from the x or y axis" cannot anticipate the claimed teaching increasing "with distance from the optical axis according to a two dimensional radial Gaussian normal distribution curve" as required by claim 1 (App. Br. 10).

Accordingly, we are constrained to reverse the Examiner's rejection of claim 1 over Stavely. Independent claims 17 and 25 recite similar limitations and thus stand with claim 1. Accordingly, we also reverse the rejection of independent claims 1, 17 and 25 and claims 2, 3, 5, 11, 12, 19, 20, and 27-29 depending respectively therefrom over Stavely.

Claims 7-10

As to claim 7, the Examiner finds that, in Stavely, "all pixels at a specific x-coordinate on a parallel line to the y-axis have a constant x-direction length while the pixels on the same x-coordinate line have increasing y-directions lengths as they get further from the x-axis" (Ans. 12). However, Appellant contends that, contrary to the Examiner's findings, "Stavely shows that the length of the sides of the pixels parallel to the y-axis increase as the distance from the x-axis increases" (App. Br. 11). In particular, Appellant contends that "[t]he length of a side of the pixel parallel to the y-axis in the Stavely array does not stay constant for all pixels of the

pixel array, as recited in claim 7, but instead stays constant for only pixels in a particular row" (*id*.). Upon review of the record, we agree with Appellant.

In particular, we do not find any teaching of "a length of a side of the pixels parallel to the x-axis increases according to the distance of the pixels from the y-axis and a length of a side of the pixels parallel to the y-axis remains constant for *all* pixels of the pixel array" (claim 7, emphasis added) comprised in the portions of Stavely relied upon by the Examiner.

As discussed above, Stavely discloses increasing the size of the imaging sensors from the center of the sensor array (FF 1). As shown in Fig. 2B of Stavely, both the side parallel to the x-axis and the side parallel to the y-axis increase from the center (FF 2). Though we find that Stavely does discloses "a length of a side of the pixels parallel to the x-axis increases according to the distance of the pixels from the y-axis" as required by claim 7, we do not find any teaching in the portions of Stavely cited by the Examiner "of a side of the pixels parallel to the y-axis remains *constant* for *all* pixels of the pixel array" (claim 7, emphasis added), contrary to the Examiner's finding. That is, we agree with Appellant that, as indicated in Fig. 2B of Stavely cited by the Examiner, the side "stays constant for only pixels in a particular row" (App. Br. 11).

Accordingly, we are constrained to reverse the Examiner's rejection of claim 7 over Stavely. Independent claim 9 recites similar limitations and thus stands with claim 7. Accordingly, we also reverse the rejection of independent claims 7 and 9 and claims 8 and 10 respectively depending therefrom over Stavely.

Claim 21

As noted *supra*, we reverse the rejection of claim 17. Claim 21 depending from claim 17 is rejected over Stavely in further view of Yonemoto. The Examiner has not identified how Yonemoto cures the noted deficiencies of Stavely. As such, we also reverse the rejection of claim 21.

Claim 36

As for claim 36, Appellant merely contends that "Stavely and Tullis cannot be combined in the manner asserted by the Examiner … because doing so would render Stavely unsatisfactory for its intended purpose" (App. Br. 13). However, the Examiner points out that "Stavely was used to show the concept of increasing the light gathering power of pixels farther from the optical axis" while "Tullis was … used to show the photosensitive area of the pixels with illumination falloff is larger tha[n] the photosensitive area of pixels not locat[ed] in the region of illumination falloff" (Ans. 14). The Examiner concludes that "Tullis could modif[y] the fill factor to compensate for light fall of vignetting as pixels get further from the optical axis center" Ans. 15). We find no error in the Examiner's conclusion.

Though Appellant argues that the combination would "render Stavely unsatisfactory for its intended purpose" (App. Br. 13), Appellant appears to be viewing the references from a different perspective than that of the Examiner. The issue here is whether one of ordinary skill in the art would have combined Stavely's teaching of increasing the light gather power of pixels near the edge to Tullis' pixels, as the Examiner concludes. We conclude that the combination of Stavely's known teaching of increasing light gathering power with Tullis' teachings of pixel array illumination would have yielded predictable results to one of ordinary skill in the art at

the time of the invention. That is, we find that the combination is no more than a simple arrangement of old elements, with each performing the same function it had been known to perform, yielding no more than one would expect from such an arrangement. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007). The skilled artisan would "be able to fit the teachings of multiple patents together like pieces of a puzzle" since the skilled artisan is "a person of ordinary creativity, not an automaton." *Id*. at 420-21.

Appellant has presented no evidence that combining Stavely's teaching of increasing light gathering power with the pixels of Tullis was "uniquely challenging or difficult for one of ordinary skill in the art" or "represented an unobvious step over the prior art." *See Leapfrog Enters. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 418-19).

Accordingly, we find that Appellant has not shown that the Examiner erred in rejecting claim 36 over Tullis in view of Stavely.

V. CONCLUSION AND DECISION

The Examiner's rejection of claim 36 under 35 U.S.C. § 103(a) is affirmed. However, the Examiner's rejection of claims 1-3, 5, 7-12, 17, 19, 20, 25, and 27-29 under 35 U.S.C. § 102(e) and of claim 21 under 35 U.S.C. § 103(a) is reversed.

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).

AFFIRM-IN-PART

peb