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EXAMINER
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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte TIM LEE

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Appeal 2019-001457
Application 15/628,877[1]
Technology Center 2600

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Before JOHN A. EVANS, JOHN P. PINKERTON, and
MICHAEL M. BARRY, *Administrative Patent Judges*.

PINKERTON, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134 from the Examiner's Final
Rejection of claims 1–11 and 14–20. Claims 12 and 13 are objected to as
being dependent upon a rejected claim, but are indicated as being allowable
if rewritten in independent form including all the limitations of the base
claim and any intervening claims. We have jurisdiction under 35 U.S.C.
§ 6(b).

We reverse.

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[1] We use the word "Appellant" to refer to "applicant" as defined in
37 C.F.R. ¶ 1.42. Appellant identifies the real party in interest as
Imagination Technologies Limited. Appeal Br. 1.

STATEMENT OF THE CASE

Introduction

Appellant's disclosed and claimed invention relates to a "binning apparatus for generating a histogram of input values of data relating to physical phenomena such as parameters of imaging devices, and to a method for binning input values so as to generate such a histogram." Spec. 1:5–7.[2]

Claims 1, 16, and 17 are independent claims. Claim 1 is illustrative of the subject matter on appeal and reads as follows (with format changes added):

> 1. Apparatus for binning an input value into one of a plurality of bins which collectively represent a histogram of input values for use by one or more processing algorithms, each of the plurality of bins representing a corresponding range of input values, the apparatus comprising:
>
> a binning controller configured to mix an input value with an error value so as to generate a modified input value and to allocate the modified input value to the bin corresponding to that modified input value.

Appeal Br. 11 (Claims App.).

Rejections on Appeal

Claims 1–3, 5–7, 10, 11, and 14–20 stand rejected under 35 U.S.C. § 102(a)(1)(2015) as being anticipated by Sullender (US 2009/0257672 A1; published Oct. 15, 2009). Final Act. 6–7.

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[2] Our Decision refers to the Final Office Action mailed January 24, 2018 ("Final Act."), Appellant's Appeal Brief filed June 25, 2018 ("Appeal Br.") and Reply Brief filed December 5, 2018 ("Reply Br."), the Examiner's Answer mailed October 5, 2018 ("Ans."), and the original Specification filed June 21, 2017 ("Spec.").

Claims 4, 8, and 9 stand rejected under 35 U.S.C. § 103 as being unpatentable over Sullender and Zhang et al. (US 2013/0329093 A1; published Dec. 12, 2013) ("Zhang"). *Id.* at 8.

ANALYSIS

The Examiner rejects independent claims 1, 16, and 17, as well as dependent claims 2, 3, 5–7, 10, 11, 14, 15, and 18–20, as being anticipated by Sullender. Final Act. 6–7. Claim 1 recites, in relevant part, "a binning controller configured to mix an input value with an error value so as to generate a modified input value and to allocate the modified input value to the bin corresponding to that modified input value." Independent claims 16 and 17 each recite a substantially similar limitation. The Examiner finds Sullender discloses these claim limitations with its description of histogram of bins, each of which is associated with an interval of specific pixel gradient values, such that the histogram is restricted to those pixels with a grey value within a subrange of the actual grey value range. *Id.* at 2–3 (citing Sullender ¶ 63), *see also id.* at 6 (citing Sullender ¶¶ 7, 12, 63–67, 88–92). The Examiner explains that the pixel gradient value corresponds to the claimed "input value," the margin (margin/rmax-rmin) used to determine the subrange corresponds to the claimed "error value," and each of the gradient values of pixels determined to be within the subrange corresponds to the claimed "modified input value." *Id.* at 3; *see also* Ans. 7–10.

Appellant disputes the Examiner's findings (App. Br. 6–9, Reply Br. 1–2) and argues that Sullender "describes binning values, but those values are not modified input values generated from mixing an input value with an error value." Reply Br. 1; *see also* Appeal Br. 8. Appellant explains that

Sullender describes "placing a condition on whether a bin of a histogram is incremented or not" and assigning a given pixel gradient value to a bin if that condition is met, but "[n]either the given pixel gradient value nor the bin are altered in any manner." Reply Br. 1–2; *see also* Appeal Br. 8. Instead, according to Appellant, a given pixel gradient value is compared with a subrange, and if it is (or is not) within the subrange, the bin is (or is not) incremented, which "is not the same as the claimed invention in which an input value is mixed with an error value . . . to generate a modified input value, wherein . . . the modified input value (not the original input value) . . . is allocated to a bin corresponding to that modified input value." Reply Br. 2; *see also* Appeal Br. 8–9. Appellant also submits that "the sub-range of pixel grey values [rmin+margin/(rmax-rmin), rmaxmargin/(rmax-rmin)] to which the gradient value is compared, is not an error value," but "[i]nstead, . . . simply a range of possible grey values that the pixel may take on." Appeal Br. 9.

We are persuaded by Appellant's arguments that the Examiner erred. "'A rejection for anticipation under section 102 requires that each and every limitation of the claimed invention be disclosed in a single prior art reference.'" *See In re Buszard*, 504 F.3d 1364, 1366 (Fed. Cir. 2007) (quoting *In re Paulsen*, 30 F.3d 1475, 1478–79 (Fed. Cir. 1994)). We have reviewed the portions of Sullender cited by the Examiner and agree with Appellant that they do not disclose mixing an input value with an error value to generate a modified input value and allocating the modified input value to the bin, as set forth in the independent claims. *See* Appeal Br. 6–9; Reply Br. 1–2. Regarding paragraph 63, while Sullender may disclose modifying the size of a histogram bin using a margin before allocating eligible pixel

gradient values to the bin, we find no evidence that Sullender discloses modifying a pixel gradient value itself in any way—let alone modifying it by mixing it with an error value—before allocating it to the bin. Nor do any of the other cited disclosures of Sullender cure this deficiency. As Appellant states, paragraph 7 "explains that the gradient calculation can include plotting a histogram of gradient values to determine maximum noise amplitude." Appeal Br. 7 (citing Sullender ¶ 7). Paragraph 12 "describes that an image is analyzed to determine an average noise amplitude and a noise distribution via a gradient calculation" for estimating noise and applying a noise filter to a data plane of an image. *Id.* (citing Sullender ¶ 12). Paragraphs 64 through 67 "explain the gradient calculation in more detail, and describe creating a histogram of pixel amplitude gradient values to detect a noise curve that indicates an average noise value and a maximum noise amplitude." *Id.* (citing Sullender ¶¶ 63–67). And, paragraphs 88 through 92 "describe that the noise analysis of the image is used to guide the filtering of the noisy image." *Id.* (citing Sullender ¶¶ 88–92).

Accordingly, constrained by this record, we decline to sustain the Examiner's rejection under 35 U.S.C. § 102(a)(1) of independent claim 1. We also decline to sustain the rejection under 35 U.S.C. § 102(a)(1) of independent claims 16 and 17, each of which recites a substantially similar limitation for which the Examiner relies on the same deficient findings and rationale as with independent claim 1. We likewise decline to sustain the Examiner's rejection under 35 U.S.C. § 102(a)(1) of dependent claims 2, 3, 5–7, 10, 11, 14, 15, and 18–20, for which the Examiner presents no additional findings that cure the deficiencies in the rejection of independent claims 1, 16, or 17. For similar reasons, we decline to sustain the rejection

under 35 U.S.C. § 103 of dependent claims 4, 8, and 9, for which the Examiner presents no additional findings or rationale that cure the deficiencies in the rejection of independent claim 1.

CONCLUSION

We reverse the Examiner's rejection of claims 1–3, 5–7, 10, 11, and 14–20 under 35 U.S.C. § 102(a)(1).

We reverse the Examiner's rejection of claims 4, 8, and 9 under 35 U.S.C. § 103.

In summary:

Claims Rejected	35 U.S.C. §	Reference(s) /Basis	Affirmed	Reversed
1–3, 5–7, 10, 11, 14–20	102(a)(1)	Sullender		1–3, 5–7, 10, 11, 14–20
4, 8, 9	103	Sullender, Zhang		4, 8, 9
Overall Outcome				1–11, 14–20

REVERSED