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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TAKASHI WAKUI

Appeal 2020-000262
Application 15/194,393
Technology Center 2800

Before ALLEN R. MacDONALD, JEAN R. HOMERE, and MICHAEL J. ENGLE, *Administrative Patent Judges*.

ENGLE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1, 17, 18, 20, and 25, which are all the claims pending in the application.[1] Appeal Br. 1, 2. 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(a). Appellant identifies FujiFilm Corp. as the real party in interest. Appeal Br. 1.

TECHNOLOGY

The claimed subject matter relates to "an image processing technique for inkjet printing" in which "a non-discharge correction process serving as an image correction function that corrects a recording fault caused by a non-discharge nozzle" is combined with "halftone processing that converts continuous-tone image data into halftone image data which is dot data." Spec. ¶ 1.

ILLUSTRATIVE CLAIM

Claim 1 is illustrative and reproduced below:

1. An image processing device comprising:

a non-discharge correction processing unit that performs an image correction process for correcting an image defect caused by a non-discharge nozzle in an inkjet head including a plurality of nozzles;

a non-discharge portion information storage unit that stores non-discharge portion information corresponding to a position of the non-discharge nozzle;

an image region discrimination unit that discriminates between a normal portion and a non-discharge correction portion in an input image, on the basis of the non-discharge portion infom1ation, wherein the normal portion is an image region other than a non-discharge correction portion to be subjected to the image correction process by the non-discharge correction processing unit and a non-discharge portion in which recording is not possible due to the non-discharge nozzle;

a first halftone processing unit configured to perform first halftone processing for the input image by using at least one first halftone processing program file to generate a first halftone image; and

a second halftone processing unit configured to perform second halftone processing for the non-discharge correction portion by using at least one second halftone processing program

file that is different from the first halftone processing program file to generate a second halftone image, the second halftone processing being different from the first halftone processing, wherein the second halftone processing unit is configured to receive an input of data that is related to the first halftone processing and generated by the first halftone processing unit to reflect a characteristic of the normal portion adjacent to the non-discharge correction portion in the second halftone image based on the data,

wherein the second halftone processing unit receives a cumulative error that is generated by an error diffusion process in the first halftone processing as an input to the second halftone processing, and

wherein the second halftone processing unit performs an error diffusion process for the non-discharge correction portion by using the cumulative error as initial error data,

the device further comprising an arithmetic processing unit,

wherein the second halftone processing unit receives the first halftone image created by the first halftone processing as an input to the second halftone processing,

wherein the arithmetic processing unit applies a blur function to the first halftone image that is given as the input to the second halftone processing,

wherein the second halftone processing unit performs the second halftone processing for data obtained by applying the blur function to the first halftone image, and

wherein the second halftone processing unit is configured to reflect a frequency characteristic of the normal portion to the non-discharge correction portion.

REFERENCES

The Examiner relies on the following prior art references:

Name	Number	Date
Hirano	US 2011/0090276 A1	Apr. 21, 2011
Nakano	US 2015/0035889 A1	Feb. 5, 2015
Sullivan	US 5,070,413	Dec. 3, 1991

REJECTION

Claims 1, 17, 18, 20, and 25 stand rejected under 35 U.S.C. § 103(a) as obvious over Hirano, Nakano, and Sullivan. Non-Final Act. 2.

ISSUE

Did the Examiner err in finding Hirano teaches or suggests all of the requirements for the first and second halftone processing units, as recited in claim 1?

ANALYSIS

Claim 1 recites (with emphasis added):

> a *first* halftone processing *unit* configured to perform first halftone processing for the input image by using at least one first halftone processing program file to generate a first halftone image; and
>
> a *second* halftone processing *unit* configured to perform second halftone processing for the non-discharge correction portion by using at least one *second halftone processing program file that is different from the first halftone processing program file* to generate a second halftone image, *the second halftone processing being different from the first halftone processing*, wherein the second halftone processing unit is configured to receive an input of data that is related to the first halftone processing and generated by the first halftone processing unit . . . .

Subsequent limitations reiterate that the output of the first halftone processing serves as input to the second halftone processing: "the second halftone processing unit receives a cumulative error that is *generated by* an error diffusion process in *the first halftone processing as an input to the second halftone processing*" and "the second halftone processing unit receives the first halftone image *created by the first halftone processing as an input to the second halftone processing*."

Independent claims 17 and 18 recite commensurate first and second halftone processing "steps."

Appellant argues that "Hirano does not explicitly teach distinct first and second halftone processing units" and "without distinct units each processing different processes, the reference cannot teach an input from one unit to the other." Appeal Br. 16.

The Examiner refers to Hirano Figures 14 and 18 as teaching "first halftone processing" and "second halftone processing," but does not expressly address the term "unit." Ans. 4. In particular, the Examiner finds those figures teach "a recursive method that feeds an[] output of the error diffusion flow [for one pixel] back into an input of the error diffusion flow for each next pixel to be evaluated." *Id.* According to the Examiner, "when there is no dot error, the first halftone processing is executed, and when there is a dot error in the following pixel, the output of the first halftone processing is fed back as an input into the second halftone processing." *Id.*; *see also* Non-Final Act. 3–4.

We agree with Appellant that the Examiner has not sufficiently explained how these are different halftone processing "units" (claim 1) or "steps" (claims 17 and 18). Absent further discussion from the Examiner or

citation to further explanations in Hirano, Figures 14 and 18 of Hirano appear to show one halftone processing step applied to multiple pixels. *See, e.g.*, Hirano ¶¶ 118 (introducing "an error diffusion process shown in FIG. 18"), 119 (explaining the two different results for "the error diffusion process"). That one step does consider an "error value calculated in error diffusion process" for prior pixels, but the Examiner has not sufficiently explained why "no dot error" versus "a dot error" result in the two "units"/"steps" and different "program files" as claimed.

Accordingly, we are constrained to reverse the Examiner's rejection of independent claims 1, 17, and 18, and their dependent claims 20 and 25.

OUTCOME

The following table summarizes the outcome of the rejection:

Claims Rejected	35 U.S.C. §	Basis	Affirmed	Reversed
1, 17, 18, 20, 25	103	Hirano, Nakano, Sullivan		1, 17, 18, 20, 25

REVERSED