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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TOSHIHIKO KAKU and JIN MURAYAMA

Appeal 2017-009608
Application 13/934,419¹
Technology Center 3700

Before FRANCISCO C. PRATS, ELIZABETH A. LAVIER, and DAVID
COTTA, *Administrative Patent Judges*.

COTTA, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims directed to an endoscope system. The Examiner rejected the claims on appeal under 35 U.S.C. § 112(b) as indefinite and under 35 U.S.C. § 103(a) as obvious.

We reverse.

¹ According to the Appellants, Fujifilm Corp. is the real party in interest. App. Br. 1.

STATEMENT OF THE CASE

Claims 1 and 4–13 are on appeal. Claim 1 is illustrative and reads as follows:

1. An endoscope system comprising:
 - a light source for applying special illumination light to a body portion, said special illumination light having a wavelength at which oxyhemoglobin and deoxyhemoglobin have different absorption coefficients;
 - an imaging device having a normal image sensor and a high-sensitivity image sensor whose sensitivity is higher than that of said normal image sensor, for imaging reflected light of said special illumination light from said body portion;
 - a processor configured for:
 - measuring a reflected light amount of said special illumination light from said body portion;
 - choosing which one of said normal and high-sensitivity image sensors to use for imaging said reflected light of said special illumination light from said body portion in accordance with said measured reflected light amount of said special illumination light; and
 - producing a special image depicting an oxygen saturation level of blood based on said signal obtained by imaging said reflected light of said special illumination light from said body portion with use of selected one of said normal and high-sensitivity image sensors
 - wherein
 - said processor measures said reflected light amount of said special illumination light by using a pixel value outputted from one of said normal and high-sensitivity image sensors, and said processor chooses which one of said normal and high-sensitivity image sensors to use for imaging said reflected light of said special illumination light from said body portion based on said reflected light amount;
 - when said normal image sensor is used, said processor stops using said normal image sensor and starts using said high-sensitivity image sensor for imaging said reflected light of said special illumination light from said body portion, if said pixel

value corresponding to said reflected light amount is less than a first sensor selection threshold value; and

when said high-sensitivity image sensor is used, said processor stops using said high sensitivity image sensor and starts using said normal image sensor for imaging said reflected light of said special illumination light from said body portion, if said pixel value corresponding to said reflected light amount is more than a second sensor selection threshold value, wherein

said second sensor selection threshold value is larger than said first sensor selection threshold value.

Claims App'x 1.

The claims stand rejected as follows.

Claims 1 and 4–12 were rejected under 35 U.S.C. § 112(b) as indefinite.

Claims 1, 5, 11, and 12 were rejected under 35 U.S.C. § 103(a) as obvious over the combination of Inoue,² Takasugi,³ Ishikawa,⁴ and Kemeny.⁵

Claims 4, 8, and 9 were rejected under 35 U.S.C. § 103(a) as obvious over the combination of Inoue, Takasugi, Ishikawa, Kemeny, and Midgley.⁶

² Inoue, US Patent No. 5,233,416, issued Aug. 3, 1993 (“Inoue”).

³ Takasugi et al., US Patent No. 5,512,940, issued Apr. 30, 1996 (“Takasugi”).

⁴ Ishikawa et al., US Patent Publication No. 2003/0067530 A1, published Apr. 10, 2003 (“Ishikawa”).

⁵ Kemeny et al., *Multiresolution Image Sensor*, 7(4) IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS FOR VIDEO TECHNOLOGY (1997) (“Kemeny”).

⁶ Midgley et al., US Patent No. 6,642,955 B1, issued Nov. 4, 2003 (“Midgley”).

Claims 6 and 10 were rejected under 35 U.S.C. § 103(a) as obvious over the combination of Inoue, Takasugi, Ishikawa, Kemeny, and Padmanabhan.⁷

Claim 7 was rejected under 35 U.S.C. § 103(a) as obvious over the combination of Inoue, Takasugi, Ishikawa, Kemeny, and Mansurov.⁸

Claim 13 was rejected under 35 U.S.C. § 103(a) as obvious over the combination of Inoue, Takasugi, Ishikawa, Kemeny, and Backman.⁹

INDEFINITENESS

For claims under examination, a claim is indefinite when it contains words or phrases whose meaning is unclear, i.e., “ambiguous, vague, incoherent, opaque, or otherwise unclear in describing and defining the claimed invention.” *In re Packard*, 751 F.3d 1307, 1310–13, 1322 (Fed. Cir. 2014); *see also* MPEP § 2173.02(I) (Rev. 07.2015, Nov. 2015) (advising examiners that a rejection for indefiniteness is appropriate “after applying the broadest reasonable interpretation to the claim, if the metes and bounds of the claimed invention are not clear”).

The Examiner finds that claims 1 and 4–13 are indefinite on two bases.¹⁰ First, the Examiner finds that the claims are indefinite because it is

⁷ Padmanabhan et al., US Patent Publication No. 2005/0105077 A1, published May 19, 2005 (“Padmanabhan”).

⁸ Mansurov, *Understanding ISO – A Beginner’s Guide*, photographylife (2009) (“Mansurov”).

⁹ Backman et al., US Patent No. 6,624,890 B2, issued Sept. 23, 2003 (“Backman”).

¹⁰ In the Examiner’s Answer, the Examiner withdrew the portion of the indefiniteness rejection finding claims 1 and 11–12 indefinite on the basis of their use of the language “wherein said light amount measurement section measures said reflected light amount of said special illumination light

not clear what is meant by “special illumination light” as used in claim 1, and how it differs from “normal illumination light.” Ans. 2–3, 19–20.

Second, the Examiner finds that it is not clear what is meant by “normal and high-sensitivity image sensors.” *Id.* at 20. We are not persuaded.

With respect to the Examiner’s first basis for finding the claims indefinite, the Specification provides clear guidance on what is meant by the term “special illumination light.” In describing the prior art, it states:

There is known an endoscope system that carries out not only normal observation for imaging an internal body portion under irradiation with white light (normal light), but also special observation for imaging the internal body portion under irradiation with specific narrow band light (special light).

Spec. 1:17–23. Thus, normal light is defined to be “white light” and special light is defined to be a “specific narrow band [of] light.” Further, in describing an endoscope system according to the present invention, the Specification states:

The lighting section applies special illumination light to a body portion. The special illumination light has a wavelength at which oxyhemoglobin and deoxyhemoglobin have different absorption coefficients.

Id. at 3:15–19. Taking these two disclosures together, it is clear that “normal light” is white light and “special illumination light” is a specific narrow band of light, in this case, one having a wavelength at which oxyhemoglobin and deoxyhemoglobin have different absorption coefficients, as recited in claim 1. Accordingly, we do not agree with the Examiner that the term “special illumination light” as used in claim 1 is indefinite.

repeatedly in certain cycles” because the claims were amended to no longer include this language. Ans. 19.

With respect to the Examiner's second basis for finding the claims indefinite, the claim itself defines the term "high sensitivity sensor" as a sensor "whose sensitivity is higher than that of said normal image sensor." We recognize that the term "high sensitivity" is a relative term. However, relative terms are not necessarily indefinite. *See Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1370 (Fed. Cir. 2014) ("Claim language employing terms of degree has long been found definite where it provided enough certainty to one of skill in the art when read in the context of the invention."). Here, it is not necessary that the claims quantify how much more sensitive the high sensitivity sensor is than the normal sensor. Rather, in the context of the claimed endoscope system, it is sufficient that the high sensitivity sensor is more sensitive than the normal sensor.

OBVIOUSNESS

The Examiner applies the same underlying combination of Inoue, Takasugi, Ishikawa, and Kemeny in all five obviousness rejections. Accordingly, the same issue is dispositive with respect to all five rejections.

The Examiner finds that Inoue discloses most of the elements of claim 1. The Examiner acknowledges, however, that Inoue does not disclose a processor that chooses between normal and high-sensitivity sensors based on an amount of reflected light. Ans. 12. For this element, the Examiner relies on paragraph 18 of Ishikawa, which reads as follows:

The image formation apparatus comprises: a light emitting device which outputs a light beam; a light beam scanning member which allows a light beam output from this light emitting device to scan toward a scanned face so that the light beam scans the scanned face in a main scanning direction; a pair of sensors which are arranged on the scanned face or a position equivalent thereto, detect a light beam scanned by the light beam scanning member, and output an electric signal; an integrator

circuit which integrates a difference between electric signals output from each of the pair of sensors; a first comparator circuit which compares a value integrated in this integrator circuit with a first threshold; a second comparator circuit which compares a value integrated in the integrator circuit with a second threshold smaller than the first threshold; and a control section which specifies first and second thresholds to the first and second comparator circuits, when the comparator circuits yield a normal comparison result, determines an output value of the integrator circuit according to magnitude relation between the first and second thresholds, and, when the comparator circuits yield an abnormal comparison result, determines whether the offset has an effect on the abnormal comparison result based on the predetermined maximum offset amount.

Ishikawa ¶ 18. Based on this disclosure, the Examiner concludes that it would have been obvious “to modify the endoscope imaging means disclosed by Inoue to further include the threshold values and controller with comparator circuitry as taught by Ishikawa et al . . . in order to understand the maximum offset amount allowed for imaging.” Ans. 13. We are not persuaded.

We do not read paragraph 18 of Ishikawa as teaching a controller that chooses a sensor. Rather, we understand it to disclose a pair of sensors that generate an electric signal which is output to an integrator circuit. Ishikawa ¶ 18. The integrator circuit uses the signal from both sensors to integrate a difference between the two signals. *Id.* We discern no point at which Ishikawa chooses to use one of the pair of sensors over the other. Rather, Ishikawa uses both sensors and determines a difference between their signals. *Id.*

In addition, the sensors in Ishikawa are not used for imaging and do not detect an amount of reflected light. Rather, the sensors in Ishikawa are used to determine the position of a beam of light in an apparatus such as a

digital copier or laser printer. *See, e.g., id.* ¶ 144 (“A pair of sensors SP and SO are patterns used for detecting a light beam’s passage position”); *see generally id.* ¶¶ 1, 140–148, and Fig. 4.

As Ishikawa does not disclose a processor that chooses between normal and high-sensitivity sensors based on an amount of reflected light, the Examiner’s proposed basis for modifying the endoscope of Inoue to arrive at the claimed endoscope system is not supported by the record. As each of the obviousness rejections relies on Inoue and Ishikawa for this element, we reverse all five of the Examiner’s obviousness rejections.

SUMMARY

In summary, we reverse the Examiner’s rejection of claims 1 and 4–12 under 35 U.S.C. § 112(b) as indefinite.

We reverse the Examiner’s rejection of claims 1, 5, 11, and 12 under 35 U.S.C. § 103(a) as obvious over the combination of Inoue, Takasugi, Ishikawa, and Kemeny.

We reverse the Examiner’s rejection of claims 4, 8, and 9 under 35 U.S.C. § 103(a) as obvious over the combination of Inoue, Takasugi, Ishikawa, Kemeny, and Midgley.

We reverse the Examiner’s rejection of claims 6 and 10 under 35 U.S.C. § 103(a) as obvious over the combination of Inoue, Takasugi, Ishikawa, Kemeny, and Padmanabhan.

We reverse the Examiner’s rejection of claim 7 under 35 U.S.C. § 103(a) as obvious over the combination of Inoue, Takasugi, Ishikawa, Kemeny, and Mansurov.

We reverse the Examiner’s rejection of claim 13 under 35 U.S.C.

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§ 103(a) as obvious over the combination of Inoue, Takasugi, Ishikawa,
Kemeny, and Backman.

REVERSED