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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CLARK R. BAKER, JR.

Appeal 2011-009111
Application 10/796,584
Technology Center 3700

Before ERIC GRIMES, LORA M. GREEN, and ERICA A. FRANKLIN, *Administrative Patent Judges*.

GREEN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the Examiner's rejection of claims 1-4, 6-16, and 18-22.[1] We have jurisdiction under 35 U.S.C. § 6(b).

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[1] Claims 5, 17, and 23-27 are also pending (App. Br. 2; Ans. 2). Claims 5 and 17 have been indicated as being free of the prior art, and claims 23-27 stand withdrawn from consideration (*id.*).

STATEMENT OF THE CASE

Claims 1 and 13 are the independent claims on appeal, and read as follows:

1. A method of detecting the presence of mixed venous and arterial blood pulsation in tissue, comprising:

receiving first and second electromagnetic radiation signals from a blood perfused tissue portion corresponding to infrared and red wavelengths of light;

obtaining a measure of a phase difference between the first and second electromagnetic radiation signals;

comparing the measure with a threshold value to form a comparison;

detecting the presence or absence of venous pulsation using the comparison; and

indicating the presence of venous pulsation to a caregiver if venous pulsation is present.

13. A device for detecting the presence of mixed venous and arterial blood pulsation in tissue, comprising:

means for receiving first and second electromagnetic radiation signals from a blood perfused tissue portion corresponding to infrared and red wavelengths of light;

means for obtaining a measure of a phase difference between the first and second electromagnetic radiation signals;

means for comparing the measure with a threshold value to form a comparison;

means for detecting the presence or absence of venous pulsation using the comparison; and

means for indicating the presence of venous pulsation to a caregiver when venous pulsation is present.

The following ground of rejection is before us for review:

Claims 1-4, 6-16, and 18-22 stand rejected under 35 U.S.C. § 103(a) as being rendered obvious by the combination of Diab,[2] Swedlow,[3] and Masimo[4] (Ans. 4).

We reverse.

ISSUE

Does the preponderance of the evidence support the Examiner's conclusion that the combination of Diab, Swedlow, and Masimo renders the claimed method and device obvious?

FINDINGS OF FACT

FF1. The Examiner relies on Diab for teaching a system "for detecting the presence of mixed venous and arterial blood pulsation in tissue" (Ans. 4).

FF2. The Examiner finds that Diab teaches "obtaining a measure of a phase difference between said first and second electromagnetic radiation signals (paragraphs 0389-0391, fig. 25B, elements 694,692, 690), comparing said measure with a threshold value to form a comparison (paragraph 0387, fig. 25B, elements 660, 662,696); and detecting the presence or absence of venous pulsation using said comparison (paragraphs 0019, 0368)" (*id.*).

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[2] Diab et al., US 2003/0036689 A1, published Feb. 20, 2003.
[3] Swedlow et al., US 5,662,106, issued Sep. 2, 1997.
[4] Goldman et al., *MASIMO SIGNAL EXTRACTION PULSE OXIMETRTY*, 16 J. CLIN. MONIT. 475-483 (2000) ("Masimo").

FF3. Specifically, the Examiner finds that "the Diab [ ] reference in Figure 25B and in paragraphs 0389-0396 of the specifications [sic] discloses calculating the phase differences between the red and infrared signals and compares it with a threshold value to detect the presence of venous blood pulsation" (*id.* at 6).

FF4. The Examiner relies on Masimo for teaching that it is known in the art that "the primary cause of noise in transmissive pulse oximetry measurements is motion artifact caused by the movement of venous blood in the finger" (*id.* at 4 (emphasis removed)).

FF5. The Examiner relies on Swedlow for teaching indicating "the presence of venous pulsation to a caregiver if venous pulsation is present" (*id.*).

FF6. Diab relates "to the processing of measured signals, containing a primary signal portion and a secondary signal portion, for the removal or derivation of either the primary or secondary signal portion when little is known about either of these components" (Diab, p. 1, ¶ 3). Diab teaches that the method "is especially useful for physiological monitoring systems including blood oxygen saturation systems" (*id.*).

FF7. As taught by Diab, "a composite signal may contain noise and desirable portions" (*id.* at 1, ¶5).

FF8. Diab teaches that a phase difference module "calculates the difference in phase between the corresponding data points from the phase modules" (*id.* at 31, ¶ 389). Diab teaches that "[i]f the magnitude of the phase difference between any two corresponding points is less than a particular threshold ….

then the sample points qualify," but "[i]f the phase of two corresponding sample points is too far apart, then the sample points are not used" (*id.*).

FF9. Diab teaches that for the "sample points which qualify, a ratio is taken in the ratio module," and "[f]or those points which do not qualify, the saturation is set to zero at the output of the saturation equation …." (*id.* at 32, ¶393).

FF10. Diab teaches that both the arterial and venous saturation may be obtained (*id.* at 32, ¶395).

ANALYSIS

Appellant argues that Diab "discusses a type of phase difference measurement between red and IR signals," but argue that the "measurement is not obtained to form a comparison with a threshold to *detect the presence of venous pulsation*" (App. Br. 8). Rather, Appellant asserts, "if the phase difference between a red and IR point is low enough, the points are used to calculate a *saturation value*" (*id.*). That is, according to Appellant, Diab at paragraphs 0389-0391, relied upon by the Examiner (FF3) for teaching detecting venous pulsation, in fact teaches calculation of arterial and venous saturation (App. Br. 8).

We find Appellant's arguments persuasive. In *KSR Int'l Co. v. Teleflex Inc*., 550 U.S. 398, 415 (2007), while the Supreme Court emphasized "an expansive and flexible approach" to the obviousness question, it also reaffirmed that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, *there must be some articulated reasoning* with some rational underpinning to support the legal

conclusion of obviousness." *Id.* at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (emphasis added)).

Here, while the Examiner asserts that paragraphs 0389-0391 of Diab relate to calculating venous pulsation (FF3), as noted by Appellant, those paragraphs in fact relate to determining arterial and venous saturation (FF10). As the Examiner has not explained how calculating arterial and venous saturation would allow the ordinary artisan to calculate venous pulsation, we reverse the rejection.

REVERSED

cdc