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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DONALD A. HENRY

Appeal 2012-007022
Application 11/594,415[1]
Technology Center 3700

Before DEMETRA J. MILLS, CHRISTOPHER G. PAULRAJ, and ELIZABETH A. LaVIER, *Administrative Patent Judges*.

LaVIER, *Administrative Patent Judge*.

DECISION ON APPEAL

The Examiner finally rejected claims 1–6, 10, 11, 14–16, 18–21, and 23–25. Appellant seeks reversal of the Examiner's rejections, pursuant to 35 U.S.C. § 134(a). We have jurisdiction under 35 U.S.C. § 6(b).

For the reasons set forth below, we REVERSE.

BACKGROUND

The Specification generally relates to a blood flow monitor with a visual display. (Spec. ¶ 2.) Claim 1 is representative:

> 1. A blood flow monitor for detecting a blood flow rate down to zero flow, within a single blood vessel, comprising:

[1] According to Appellant, the real party in interest is Cook Vascular Incorporated. (Br. 4.)

a transducer probe directly contactable on a single blood vessel, a visual display, and a speaker;

a probe monitoring circuit in electrical communication with said probe, where the probe monitoring circuit is configured to transmit a burst signal at a predetermined first frequency and receive a reflected signal at a second frequency;

a mixer comprising an input in electrical communication with the probe monitoring circuit and an output in electrical communication with a first signal path and a second signal path, where the mixer is configured to compare the difference between the first frequency and the second frequency to determine a frequency shift, the frequency shift representative of a blood flow rate within the single blood vessel, wherein the frequency shift has a range between zero to indicate a zero flow rate and an upper limit frequency with a threshold frequency therebetween, where the threshold frequency is a frequency that is at least audible in said speaker, the mixer further configured to output a signal at a frequency of the frequency shift to each of the first and second signal paths;

the first signal path including the speaker in electric communication with the output of the mixer, the speaker configured to produce an audible sound in response to the frequency shift signal having a frequency between the threshold frequency and the upper limit frequency to audibly indicate said blood vessel having a blood flow rate; and

the second signal path including a signal processing circuit comprising an input in electrical communication with the output of the mixer and an output in electrical communication with the visual display, where the signal processing circuit is configured to drive the visual display with a signal in response to the frequency shift signal having a frequency between zero and the threshold frequency to visually indicate the blood vessel having a blood flow,

wherein the visual display is configured to provide incremental visual indication of the blood flow rate when said blood flow rate is within a range from a blood flow rate associated with said threshold frequency down to said zero flow rate.

(Br. 41–42 (Claims App.) (emphasis added).)

REJECTIONS

On appeal, the Examiner maintains the following rejections:

1. Claims 1–6, 10, 14–16, 18–21, and 23–25 are rejected under 35 U.S.C. § 103(a) as unpatentable over Moehring.[2] (Ans. 5.)
2. Claim 11 is rejected under 35 U.S.C. § 103(a) as unpatentable over Moehring in view of Abend.[3] (Ans. 9.)
3. Claim 1 is alternately rejected under 35 U.S.C. § 103(a) as unpatentable over Moehring in view of Shuros.[4] (Ans. 10.)

DISCUSSION

Moehring is the primary (or sole) reference for each of the three obviousness rejections maintained on appeal by the Examiner. (*See* Ans. 5–10.) Moehring generally describes an ultrasound system for monitoring blood flow, with a graphical display presenting depth and spectrogram information. (Moehring Abstract.) However, as the Examiner acknowledges, Moehring "do[es] not explicitly teach the visual display is configured to provide incremental visual indication of the blood flow rate from a threshold frequency down to zero flow rate," (Ans. 6), as required in some fashion by limitations of each of independent claims 1, 14,[5] and 19.[6]

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[2] U.S. Patent No. US 6,616,611 B1, issued Sept. 9, 2003.
[3] U.S. Patent No. US 6,682,483 B1, issued Jan. 27, 2004.
[4] U.S. Patent Application Pub. No. US 2007/0088214 A1, published Apr. 19, 2007.
[5] Claim 14 recites a processing circuit, including scaling logic "configured to generate a scaled signal capable of driving a visual display that is incremental, the scaled signal indicative of the frequency shift in the range between zero and the threshold frequency in order to *visually represent the*

Indeed, Moehring expressly filters out low-frequency signals: "to avoid display of spurious information, signals that may be intense but low velocity (such as due to tissue motion) are ignored and not displayed in the depth-mode display. . . ." (Moehring col. 4, ll. 22–26; *see also id.* col. 11, ll. 2–4 (providing exemplary filter cutoffs at 100 Hz, 200 Hz, and 300 Hz).) Nonetheless, the Examiner finds that one of ordinary skill in the art would have found it obvious to try a method of visually displaying data from a threshold frequency down to zero while "refining efforts to reduce the negative effects of tissue/probe motion and noise not indicative of blood flow" that are described in Moehring, thus providing a "display of raw/unfiltered data from zero frequency to a defined upper threshold frequency." (Ans. 6; *see also id.* at 10.)

Appellant argues, and we agree, that Moehring teaches away from the claimed invention. (*See* Br. 23–28.) "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). As explained above, Moehring expressly excludes displaying low- and zero-frequency data. In contrast, the

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blood flow rate associated with the blood vessel when said blood flow rate is *in a range from a blood flow rate associated with said threshold frequency down to said zero flow rate*." (Claims App. (emphases added).)

[6] Claim 19 recites a method of monitoring blood flow rate, wherein one of the steps is "driving a visual display configured to *provide incremental visual indication of the blood flow rate* within the body vessel *when the frequency shift is within a range from the threshold frequency down to zero frequency to represent a low flow rate associated with the blood vessel*. . . ." (Claims App. (emphases added).)

claims and the Specification consistently focus on displaying low-frequency signals, which can correspond to lower blood flow rates. (*See, e.g.*, Spec. ¶¶ 7–8 (discussing need to detect lower frequency responses, such as below 100 Hz, especially for larger blood vessels); *see also id.* at ¶¶ 22, 26.)

The Examiner responds that the low-frequency data deemed to be noise by Moehring are "not representative of blood flow but instead tissue motion, and therefore, the signal present fully represents blood flow." (Ans. 10.) Thus, the Examiner argues that Moehring does not teach away from the claimed invention. (Ans. 11.) But while Moehring gives tissue motion as an *example* of a low-frequency noise source, Moehring's system nonetheless excludes *all* low-frequency signals, regardless of source. (*See* Moehring, col. 4, ll. 48–50 ("Detected signals having a power below the noise threshold . . . are ignored.").) The Examiner cites no support in Moehring for the proposition that Moehring "only removes data that do[] not represent blood flow," (Ans. 11), and we see none. Accordingly, we disagree with the Examiner that Moehring's data "fully represent[] blood flow" after removal of the low frequencies (*id.*).

With respect to claim 1, the Examiner further notes that it is an apparatus claim, and finds that the "wherein the visual display is configured to provide incremental visual indication of the blood flow rate when said blood flow rate is within a range from a blood flow rate associated with said threshold frequency down to said zero flow rate" limitation includes functional language not defining additional structure. (Ans. 11.) This is unavailing because the presence of functional language in an apparatus claim does not excuse the absence of a prima facie case of obviousness. Although claims directed to an apparatus must be distinguished from the

prior art in terms of structure rather than function, to satisfy the functional limitations in an apparatus claim, the prior art apparatus must be capable of performing the claimed function. *See In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997). In addition, the mere capability of performing the claimed function is not the complete inquiry; the Examiner should additionally determine whether it would have been obvious to modify the prior art system to arrive at the claimed system. *See In re Giannelli*, 739 F.3d 1375, 1380 (Fed. Cir. 2014). As "[p]hysical capability alone does not render obvious that which is contraindicated," *id.*, the Examiner's assessment that Moehring is "capable of" the functions recited in claim 1, (Ans. 11), is insufficient in view of our conclusion that Moehring teaches away from those very functions.

As Moehring teaches away from the claimed invention, we conclude that the Examiner failed to establish a prima facie case of obviousness based on Moehring alone or in combination with the other cited references, which do not cure the deficiencies of Moehring. Accordingly, we reverse the Examiner's rejections.

CONCLUSION

The Examiner's final rejections of claims 1–6, 10, 11, 14–16, 18–21, and 23–25 as obvious are reversed.

REVERSED

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