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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JÉRÉMY BERCOFF, DAVID SAVERY,
CLAUDE COHEN-BACRIE, and JACQUES SOUQUET

Appeal 2018-002517
Application 12/294,898
Technology Center 3700

Before KENNETH G. SCHOPFER, AMEE A. SHAH, and
ROBERT J. SILVERMAN, *Administrative Patent Judges*.

SHAH, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), the Appellant¹ appeals from the Examiner's final decision to reject claims 1, 3–16, and 18, which are all of the pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. The Appellant identifies the real party in interest as “Super Sonic Imagine.” Appeal Br. 2.

CLAIMED SUBJECT MATTER

The Appellant's invention relates generally to "imaging a visco-elastic medium and including studying movements that exist in the visco-elastic medium," and particularly to

methods comprising an excitation step during which an internal mechanical stress is generated in an excitation zone, followed by a step of imaging by acquiring signals during the movements generated in the visco-elastic medium in response to the internal mechanical stress in an imaging zone which includes the excitation zone.

Spec. 1, ll. 5–11.

Claims 1 and 14–16 are the independent claims. Claim 1 is illustrative of the subject matter on appeal and is reproduced below:

1. A method of two or three-dimensional imaging of a visco-elastic medium with a device comprising an ultrasonic probe comprising at least a first transducer element and a second transducer element,

the method comprising the following steps:

exciting, by at least the first transducer element, the medium at a given depth within an excitation zone in the depth of the medium, which generates an internal mechanical stress that is localized within the medium in the excitation zone, the internal mechanical stress being of sufficient energy to cause tissue to be moved, generating a shear wave;

imaging, by at least the second transducer element, an imaging zone of the medium that comprises the excitation zone;

acquiring displacement signals during movements generated by the internal mechanical stress in the visco-elastic medium in response to the internal mechanical stress, the movements resulting from the propagation of the shear wave, the displacement signals including a first displacement signal and a second displacement signal, wherein:

the first displacement signal corresponds to a first point in the excitation zone in response to the internal mechanical stress, and

the second displacement signal corresponds to a second point in the imaging zone at the same depth as the first point but outside the excitation zone, and

calculating, using a microprocessor, a quantitative index associated with rheological properties of the visco-elastic medium, the quantitative index being representative of a comparison between at least one of time variations and amplitude variations of the first and second displacement signals.

Appeal Br. 7 (Claims App.).

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Hynynen et al. ("Hynynen")	US 2005/0004466 A1	Jan. 6, 2005
Kantorovich et al. ("Kantorovich")	US 7,112,173 B1	Sept. 26, 2006
Matsumura et al. ("Matsumura")	US 2007/0112267 A1	May 17, 2007
Kathryn Nightingale, "On the Feasibility of Remote Palpation Using Acoustic Radiation Force," J. Acoust. Soc. Am. 110, 625–634 (July 2001) ("Nightingale")		
Jeremy Bercoff et al., <u>Study of Viscous and Elastic Properties of Soft Tissues Using Supersonic Shear Imaging</u> , 2003 IEEE Ultrasonics Symposium, 925–928 (2003) ("Bercoff")		

REJECTIONS

Claims 1, 3–16, and 18 stand rejected under 35 U.S.C. § 112(a) or 35 U.S.C. § 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement.

Claims 1, 3–6, 8, 10, 11, 13–16, and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nightingale, Hynynen, and Kantorovich.

Claims 7 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nightingale, Hynynen, Kantorovich, and Matsumura.

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Nightingale, Hynynen, Kantorovich, and Bercoff.

OPINION

Written Description

The Examiner rejects claims 1, 3–16, and 18 because the claim limitation “microprocessor” in claims 1 and 14 was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention.

Final Act. 3. Specifically, the Examiner finds that the Specification does not “recite or disclose any microprocessor or computer.” *Id.* The Examiner appears to find that because the Specification does not include the term “microprocessor,” the Appellant has not shown possession that a “microprocessor or a computer [is] . . . the proper structure that performs the calculation of the quantitative index.” Ans. 9.

The Appellant directs attention to page 8, line 18, of the Specification as “clearly disclos[ing] software module 5. Software module 5 is described as controlling electronic channels in order to implement excitation and imaging sequences.” Appeal Br. 2–3. The Appellant argues that one of ordinary skill in the art would understand “software is executed with a microprocessor” because “[t]he use of microprocessors to run software is ubiquitous” (*id.* at 3), as evidenced by “[c]ommon computers and smartphones” (Reply Br. 2).

To satisfy the written description requirement under 35 U.S.C. § 112(a), the specification must “reasonably convey[] to those skilled in the art that the inventor had possession” of the claimed invention as of the filing date. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). An adequate description does not require any particular form of disclosure or that the Specification recite the claimed invention *in haec verba*, but must do more than render the claimed invention obvious. *Id.* at 1352. As stated in *Ex parte Parks*, however, adequate written description “does not require literal support for the claimed invention.” *Ex parte Parks*, 30 USPQ2d 1234, 1236 (BPAI 1993) (emphasis omitted). As such, “a lack of literal support does not, in and of itself, establish a prima facie case for lack of adequate descriptive support” *Id.* (emphasis omitted). “Rather, it is sufficient if the originally-filed disclosure would have conveyed to one having ordinary skill in the art that an appellant had possession of the concept of what is claimed.” *Id.*

Although the Examiner is correct that the Specification does not discuss a microprocessor or any computer structure that would implement the software modules, the Examiner has not explained why the Specification

would not reasonably convey to one of ordinary skill in the art that the Appellant had possession of the calculating being performed by a microprocessor. The Specification provides for calculating a quantitative index (*see, e.g.*, Spec. Abstract, 2–5, 10–12, 14, 15) and for a device and a program implemented by a device to calculate the index (*id.* at 6, ll. 4–33). The Examiner has not adequately explained why one of ordinary skill in the art would not understand that the device would comprise a microprocessor such as by providing, for example, types of devices other than a microprocessor that would be capable of implementing a software module or program. Rather, the Examiner “did not make any statement or [take] . . . the position that one of ordinary skill in the art would not understand that software is execute[d] with a microprocessor.” Ans. 9.

Thus, we do not sustain the written description rejection of the claims.

Obviousness

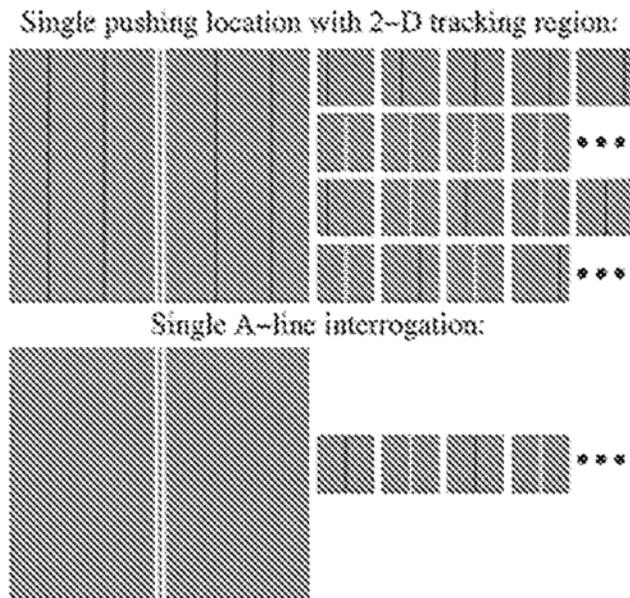
The Appellant presents argument for claims 1, 3–6, 8, 10, 11, 13–16, and 18 together. *See* Appeal Br. 3, 6. The Appellant relies on those same arguments for the remaining dependent claims 7, 9, and 12. *See id.* at 6. Thus, we consider the claims as a group with claim 1 as representative, and claims 3–16 and 18 standing or falling therewith. *See* 37 C.F.R. 41.37(c)(1)(iv) (2016).

The Appellant contends, in relevant part, that the Examiner’s rejection of claim 1 is in error because “THE PRIOR ART LACKS [APPELLANT’S] . . . CLAIMED FEATURE OF ‘the second displacement signal corresponds to a second point in the imaging zone at the same depth as the first point but outside the excitation zone.’” Appeal Br. 3. Specifically, the Appellant

argues that Nightingale’s Figure 3 discloses focus points, but not locations of the excitation zones. “Therefore, one of ordinary skill in the art cannot look at Nightingale, Fig. 3 and determine whether displacement signals are being acquired outside of an excitation zone because an excitation zone is not disclosed (only exemplary lines where ‘pushing’ occurs).” *Id.* at 4. Further, “Nightingale includes no disclosure of the depth from which the second displacement signal is acquired.” *Id.*

Conversely, the Examiner finds that Nightingale’s Figures 2–5 teach the limitation. *See* Ans. 11–12; Final Act. 4.

Nightingale describes “[a] method of acoustic remote palpation, capable of imaging local variations in the mechanical properties of tissue” whereby “[a] single diagnostic transducer and modified ultrasonic imaging system are used to perform remote palpation.” Nightingale 625. Figure 2 depicts a linear transducer configuration. *Id.* at 627. Figure 3, shown below, is a “[s]chematic of the beam sequences for the different experiments.” *Id.* at 628.



The black lines indicate tracking lines, and the white lines indicate pushing lines. The larger image on the left presents the spatial relationship of all of the lines. The smaller images on the right indicate the line firing sequences, in order from left to right. Top: single pushing location with 2-D (B-mode) tracking region. For brevity, this schematic shows only 5 spatially separated tracking lines. The different spatial locations are interrogated by using different sub-apertures (or groups of elements) in the array. Bottom: single A-line interrogation with alternating track and push lines.

Id. Figures 4 and 5 depict displacement maps after 10 milliseconds of force application. *Id.* at 630.

The Examiner finds, in relevant part, that Nightingale’s Figure 3 shows that at least one point (first displacement signal) of the excitation zone (the black line within the white line) and at least second point (second displacement signal) of the imaging zone (the other black tracking lines, two left of the white line and two right of the white line), which is the same depth as the first point but outside the excitation zone.

Ans. 10. The Examiner makes a number of interpretations regarding Nightingale’s Figure 3. *Id.* at 11–12. For example, the Examiner interprets “the middle black tracking line [of the five black tracking lines] is in the white line which represent[s] the excitation zone,” “two black tracking lines left of the white excitation zone and two black tracking lines right of the white excitation zone . . . [are] outside of the while line which represent[s] the excitation zone,” and “the middle black tracking line which is within the white excitation line which represent[s] the first point and the other black tracking lines reprints [sic] the second point are same depth.” *Id.*

However, the Examiner does not adequately explain, with reasoning or evidence from Nightingale, how or where Nightingale teaches the

locations of the excitation zones or the depth of the focal points. Without further explanation or evidence how Nightingale’s depiction of special relationship and line firing sequence meet the claimed limitation, the Examiner’s interpretations are not adequately supported.

Thus, based on the record before us, we are persuaded of Examiner error, and we do not sustain the obviousness rejection of claim 1. The rejections of the remaining claims fall with claim 1.

CONCLUSION

The Examiner’s decision to reject claims 1, 3–16, and 18 is not sustained.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 3–16, 18	112(a)	Written Description		1, 3–16, 18
1, 3–6, 8, 10, 11, 13–16, 18	103	Nightingale, Hynynen		1, 3–6, 8, 10, 11, 13–16, 18
7, 12	103	Nightingale, Hynynen, Kantorovich, Matsumura		7, 12
9	103	Nightingale, Hynynen, Kantorovich, Bercoff		9
Overall Outcome				1, 3–16, 18

REVERSED