UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte RAINER KUTH

Appeal 2007-4017
Application 10/213,040[1]
Technology Center 3700

Decided: December 15, 2008

Before TONI R. SCHEINER, DEMETRA J. MILLS, and RICHARD M. LEBOVITZ, *Administrative Patent Judges*.

SCHEINER, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a tactile feedback method. The Examiner has rejected the claims as obvious. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

---

[1] Application for patent filed August 6, 2002. The real party in interest is Siemens AG.

STATEMENT OF THE CASE

Claims 1-14 are pending and on appeal. The Examiner rejected the claims as follows:[2]

- Claims 1, 2, 5-8, and 11-14 under 35 U.S.C. § 103(a) as unpatentable over Ombrellaro (U.S. Patent 6,491,649 B1, issued December 10, 2002) in view of Ehman (U.S. Patent 5,592,085, issued January 7, 1997).

- Claims 3, 4, 9, and 10 under 35 U.S.C. § 103(a) as unpatentable over Ombrallaro, Ehman, and Kramer (U.S. Patent 6,924,787 B2, issued August 2, 2005).

Claim 1 is representative:

1. A method for providing a tactile presentation of tissue elasticity for tissue in the interior of a body, comprising the steps of:

in a non-contacting measuring device, electronically designating a tissue region, for which tissue elasticity is to be presented, located in an interior of a body, including designating a virtual tissue boundary of a tissue structure in said tissue region;

measuring said elasticity of said region of said tissue with said non-contacting measurement device, and thereby obtaining measured data representing elasticity and said boundary region;

transmitting said measured data to a machine-human interface which conveys haptic feedback information to the user dependent on said measured data allowing said user to hapticly perceive said elasticity and said virtual boundary; and

generating control data for said region by manipulating said machine-human interface with a finger of said user relative to said virtual boundary and using said control data to control said measurement of elasticity.

---

[2] The Examiner's rejections are set forth in the Final Rejection mailed April 19, 2006, rather than in the Examiner's Answer.

ISSUE ON APPEAL

Appellant invented a non-invasive method of hapticly perceiving (i.e., "feeling") the elasticity of a tissue inside a patient's body, without direct contact with the internal tissue (or the patient) by a physician during examination of the patient (Spec. 1, 3, 4).

There are two rejections of the claims for obviousness, and Appellant's principal contention with respect to both rejections focuses on the Examiner's interpretation of the teachings of Ombrellaro, the primary reference in each rejection.

The Examiner found that "Ombrellaro discloses a method for providing a tactile presentation of tissue elasticity for tissue in an interior of a body" (Final Rej. 2), which includes the step of "designating a virtual boundary surface in . . . said tissue" (*id.* at 4), "corresponding to the area of the patient the user wishes to 'feel'" (*id.* at 6), and therefore, "teaches all the limitations of the claim[s] except . . . a non-contacting measuring device" (*id.* at 5).

Appellant contends that the claimed method requires designating a virtual boundary in a patient's tissue that will be hapticly perceived by a physician during examination of the patient (Reply Br. 3). That is, the claimed method requires designating or establishing a virtual boundary *inside* the patient that will be "felt" by the physician, who is not in direct contact with the patient. Appellant acknowledges that Ombrellaro "teaches displaying an image of a region to be examined by a simulated manual examination, and that tissue . . . in the displayed image will inherently exhibit boundaries" (*id.* at 2) but contends that "such an image . . . does no

more than allow a physician to *visually perceive* such boundaries" (*id.* at 2, emphasis altered), which is not the same as "*designating* a virtual boundary that is *hapticly perceived* by the physician" (*id.* at 3, emphasis altered).

Thus, the issue raised by this appeal with respect to both rejections is as follows: Does the prior art disclose or suggest a method of providing a tactile presentation of tissue elasticity which includes designating a virtual boundary, *inside* a patient's tissue, which can be haptically perceived during remote examination of the patient?

FINDINGS OF FACT

FF1 According to the present Specification, a number of previously known techniques, for example ultrasound elastography and MR [magnetic resonance] elastography, make it "possible to obtain measured data that reproduce 3D [three dimensional] resolved properties of the elasticity of deeply residing and/or very small body parts" non-invasively (Spec. 2). In addition, a number of devices have been developed which "convey[ ] tactile feedback information dependent on the measured data to . . . a user" through "a machine/human interface" (*id.* at 3).

FF2 Appellant invented a non-invasive method of hapticly perceiving (i.e., "feeling") "the elasticity of tissue in the inside of a [patient's] body" (Spec. 4). The method requires designating a virtual boundary *inside* the patient which will be "felt" by the physician during a remote examination of the patient. (Spec. 1, 3, 4; claim 1).

FF3 Ombrellaro describes a device that simulates direct contact between a physician and a patient. The device

> includes a physician's hand control unit (HCU) that is used by a physician to generate tactile stimuli, and is coupled by a

> computer system to a patient examination module (PEM) that applies the tactile stimuli to a patient and detects and transmits feedback corresponding to the detected response back to the HCU.
>
> The HCU has . . . sensory modulation subunits, and is adapted to receive the physician's hand such that the physician has access to the sensory modulation subunits. The PEM is adapted to contact or receive a portion of a patient's anatomy, preferably by wrapping around a portion of the patient, and has . . . sensory modulation subunits that are thereby placed adjacent to the patient. The sensory modulation subunits detect forces or pressures applied to the subunits to produce corresponding output signals, and exert forces and/or displacements in response to input signals.

(Ombrellaro, col. 2, ll. 50-66.)

> The HCU **100** receives the mechanically applied pressure signal generated by the physician's hand and converts it to an electrical signal via the pressure transducer **144**, while simultaneously converting the incoming electrical signal derived from the pressure response at the patient examination module **200** into a resistance signal that is applied to the piston resistor **148** mounted against the support platform. This ability of the sensory modulation subunit **140** to both "sense" the input pressure applied by the user and simultaneously provide a direct resistance feedback response to the user simulates the actual events that occur when one presses their hand against another object. Higher degrees of resistance sensed by the PEM **200** (actual patient response) in response to the direct pressure applied to the patient . . . translates into a sensation of greater resistance or a "lack of give" to the simulated skin slab **142**. This feedback resistance can be perceived by the user as the direct response from the patient to the forces applied by the physician.

(Ombrellaro, col. 6, l. 57 to col. 7, l. 13.)

FF4 Ombrellaro's PEM is a pad made of soft, semi-compliant material, and is applied directly over the portion of the surface of the patient's body to be examined. The pad is subdivided into basic structural units called cells or cell zones, and the number of selected or activated cells "corresponds to the area of the patient's body the physician wishes to 'press on' to elicit the patient's response to the applied 'hand' pressure" (Ombrellaro, col. 7, ll. 33-39; col. 8, ll. 2-3; col. 10, ll. 25-27).

FF5 Thus, selection or activation of the cells in Ombrellaro's device merely designates a two dimensional boundary, or perimeter, around an area on the surface of the patient's body to be examined, rather than designating a boundary inside the patient's body, which will be hapticly perceived.

PRINCIPLES OF LAW

"In proceedings before the Patent and Trademark Office, the Examiner bears the burden of establishing a *prima facie* case of obviousness based upon the prior art." *In re Fritch*, 972 F.2d 1260, 1265 (Fed. Cir. 1992). Obviousness requires a suggestion of all the elements in a claim (*CFMT, Inc. v. Yieldup Int'l Corp*., 349 F.3d 1333, 1342 (Fed. Cir. 2003)) and "a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR Int'l Co. v. Teleflex Inc*., 127 S. Ct. 1727, 1741 (2007).

ANALYSIS

All of the claims on appeal are directed to a non-invasive method of hapticly perceiving (i.e., "feeling") the elasticity of a tissue inside a patient's body, and all of the claims require designating a virtual boundary *inside* the

patient, where the virtual boundary will be "felt" by the physician during a remote examination of the patient (FF2).

Ombrellaro describes a method of allowing a physician to remotely hapticly perceive (i.e., remotely "feel") the resistence or "give" (i.e., elasticity) of tissue using a Patient Examination Module (PEM) which is in contact with a portion of the surface of a patient's body (FF3). Ombrellaro designates a virtual boundary to be hapticly perceived by the physician, in the sense that the PEM is configured to receive data in an area with a designated perimeter, or "boundary," and to return data to the physician from that area (FF4, 5). Moreover, the physician can "feel" the elasticity of the tissue beneath the body surface in contact with the PEM, in the same way that the physician can evaluate the elasticity of tissue beneath the skin during a "hands on" external examination (FF3). However, the "boundary" designated by Ombrellaro is not "a virtual tissue boundary of a tissue" *inside* the body (FF4, 5), and therefore does not allow the physician to haptically perceive the elasticity of the internal boundary in the way that the elasticity would be perceived if the physician could touch an actual internal boundary.

To put it more graphically, both Ombrellaro and the present invention simulate the experience of touching and feeling a patient, but Ombrellaro simulates touching the surface of a patient's body to evaluate its resistance to pressure and so gain a sense of the elasticity of the tissue beneath the surface, while the present invention simulates inserting a hand *beneath* the surface of the patient's body and "feeling" the elasticity of the tissue within, essentially bypassing the surface of the body.

Again, all of the claims on appeal require designating a virtual boundary *inside* a patient, where the virtual boundary itself can be hapticly perceived, i.e., "felt," by a physician during subsequent remote examination of the patient. Ombrellaro does not teach or suggest designating such a virtual boundary, *inside* a patient's tissue, which can be haptically perceived by a physician who is not in direct contact with the patient, nor is this inventive element taught or suggested by Ehman or Kramer.

CONCLUSIONS OF LAW

The prior art does not disclose or suggest a method of providing a tactile presentation of tissue elasticity which includes designating a virtual boundary, *inside* a patient's tissue, which can be haptically perceived during remote examination of the patient.

SUMMARY

We reverse the rejection of claims 1, 2, 5-8, and 11-14 under 35 U.S.C. § 103(a) as unpatentable over Ombrellaro and Ehman, and the rejection of claims 3, 4, 9, and 10 as unpatentable over Ombrellaro, Ehman, and Kramer.

REVERSED

clj

SCHIFF, HARDIN & WAITE
PATENT DEPARTMENT
6600 SEARS TOWER
233 SOUTH WACKER DRIVE
CHICAGO, IL 60606