UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/260,811	10/29/2008	Kimberly Krugman	H-US-00902 (1850-29)	3341

90039 7590 11/21/2016
Covidien LP
Attn: IP Legal
5920 Longbow Drive
Mail Stop A36
Boulder, CO 80301-3299

EXAMINER
PENG, BO JOSEPH

ART UNIT	PAPER NUMBER
3768	

NOTIFICATION DATE	DELIVERY MODE
11/21/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mail@cdfslaw.com
SurgicalUS@covidien.com
medtronic_mitg-si_docketing@cardinal-ip.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KIMBERLY KRUGMAN
and CASEY M. LADTKOW

Appeal 2015-002505
Application 12/260,811
Technology Center 3700

Before JAMES P. CALVE, GEORGE R. HOSKINS, and FREDERICK C. LANEY, *Administrative Patent Judges*.

CALVE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the final rejection of claims 1–14. *See* Br. 9. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

CLAIMED SUBJECT MATTER

Claim 1, the sole independent claim, is reproduced below.

1. A method for determining a volume of ablated tissue comprising:

supplying energy from at least one electrode to tissue to create a tissue ablation volume;

indicating an axis within the tissue ablation volume based on a trajectory of the at least one electrode inserted through the tissue ablation volume;

simulating slicing of the tissue ablation volume transverse to the axis to obtain a plurality of simulated slices of the tissue ablation volume, each of the plurality of simulated slices of the tissue ablation volume having a thickness, a cross-sectional perimeter, and a trajectory point defined by the axis;

determining a volume of each of the plurality of simulated slices of the tissue ablation volume based on the trajectory point, the cross-sectional perimeter, and the thickness of each simulated slice of the tissue ablation volume; and

summing the volumes from each of the plurality of simulated slices of the tissue ablation volume to obtain the volume of the ablated tissue.

REJECTIONS[1]

Claims 1, 3–8, and 10–14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rittman, III (US 6,575,969 B1, iss. June 10, 2003) ("Rittman"), Butz ("Pre- and Intra-operative Planning and Simulation of Percutaneous Tumor Ablation," Third International Conference on Medical Image Computing and Computer Assisted Intervention, Pittsburgh, PA, Oct. 11–14, 2000, 317–326) (hereinafter "Butz"), and Vass (US 2005/0197568 A1, pub. Sept. 8, 2005).

[1] The Examiner withdrew the rejection of claim 1 under 35 U.S.C. § 112, first paragraph, for lack of written description. *See* Ans. 10.

Claims 2 and 9 are rejected under 35 U.S.C. § 103(a) as unpatentable over Rittman, Butz, Vass, and Woloszko (US 7,429,262 B2, iss. Sept. 30, 2008).

ANALYSIS

Claims 1, 3–8, and 10–14 as unpatentable over Rittman, Butz, and Vass

Regarding claim 1, the Examiner found that Rittman teaches a method for determining a volume of ablated tissue, including supplying energy from an electrode to create a tissue ablation volume, indicating an axis within the tissue ablation volume based on a trajectory of the electrode, and simulating slices of the tissue ablation volume, but fails to teach explicitly simulating a plurality of slices of tissue ablation volume substantially perpendicular to the axis and having a thickness, cross-section perimeter, and trajectory point that is defined by the axis and "determining a volume of each of the plurality of simulated slices of tissue ablation volume." Final Act. 4–5, 6.

Appellants argue that there is no teaching in Rittman of obtaining a volume of even a single slice of a created tissue ablation volume, much less simulating the slicing of the tissue ablation volume transverse to the axis to obtain a plurality of simulated slices, as claimed. Appeal Br. 6–7. Instead, Appellants argue that Rittman only describes providing a clinician with a visual appreciation of the size of the total heat ablation volume. *Id.* at 7.

Appellants argue that Butz and Vass do not remedy these deficiencies of Rittman. *Id.* Appellants argue that Butz teaches pre-operative simulation software that uses a 3D slicer to visualize 2D slices of a 3D MR scan, but does not obtain a volume of even a single slice. *Id.* Appellants argue that Vass describes how to display and store medical images that may be stacked together but does not determine a tissue ablation volume. *Id.* at 7–8.

The Examiner has not established by a preponderance of evidence that Rittman, Butz, and Vass teach or suggest a method of determining a volume of ablated tissue by obtaining plural simulated slices of the tissue ablation volume having a thickness, cross-sectional perimeter, and trajectory point defined by an axis, determining a volume of each simulated slice based on the trajectory point, cross-sectional perimeter, and thickness of each slice, and summing the volumes to obtain the volume of the ablated tissue. The Examiner recognizes that Rittman simulates tissue ablation *slices* 916, 918, but does not determine a volume of the slices based on a cross-sectional perimeter, thickness, or trajectory point. Final Act. 4–5. The Examiner's finding that Rittman obtains ablation volume from multiple CT slices that have a thickness and cross-sectional perimeter such that it would have been obvious to obtain ablation volume by summing the volume of each slice (*id.* at 5–6) is not supported by a preponderance of evidence. Rittman visualizes thermal ablation volumes via scanning and contrast materials (*see* Ans. 12), but the 2D images of tomographic *cuts/slices* through the body 916, 918 do not represent thicknesses or volumes of individual CT slices. *See* Rittman, 22:39–67, Fig. 9. The Examiner provides no basis for this determination. Final Act. 4–6; Ans. 11–13. Rittman acquires image scan data and stores it for access, rendering, and graphic representation, and the two-dimensional images (slices 916, 918) can be fused together, overlaid, and manipulated in 3D. Rittman, 22:42–67. The Examiner has not explained how fusing such 2D slices to depict ablation volumes, e.g. by spacing slices 916, 918 in an orthogonal direction as in Figure 9, teaches or suggests the calculation of the thicknesses or volumes of individual slices, or the summing of volumes of each slice to obtain tissue ablation volumes, as claimed.

The Examiner's reliance on Butz to teach visualization of 2D planar slices of 3D MR scans in orthogonal orientations (Final Act. 6; Ans. 13) does not teach or suggest these limitations either. The Examiner has not explained how Butz's visualization of ablated volumes based on 2D slices requires calculations of the perimeters, thicknesses, or volumes of the slices. Nor does Butz's use of 2D slices to render 3D scenes of a patient's anatomy via a 3D Slicer (Butz, 3 (§ 2.1)) and check the ablated volumes (Ans. 13) necessarily teach or suggest the calculation of perimeters and volumes of the slices, or the summing of slice volumes to obtain tissue ablation volumes.

The Examiner's finding that Vass obtains tissue volume by summing or stacking targeted slices (Ans. 14; Final Act. 6–7) is not supported by a preponderance of evidence. Appeal Br. 7–8. Vass teaches that 2D image slices taken by a CT scan are formed of pixels and are stacked together where each pixel corresponds to a small volume of tissue called a voxel. Vass ¶ 47. The Examiner has not explained how this disclosure teaches or suggests the calculation of the volume of each slice, or the calculation of tissue ablation volumes by summing the volumes of individual 2D image slices (Ans. 14) when Vass provides 3D anatomical models to facilitate atrial fibrillation ablation and therapy, e.g., by scarring the heart's surface or by emplacing leads in the heart. *See* Vass ¶¶ 6–23, 45–47, 66, 74–76.

Thus, we do not sustain the rejection of claims 1, 3–8, and 10–14.

Claims 2 and 9 as unpatentable over Rittman, Butz, Vass, and Woloszko

The Examiner's reliance on Woloszko to teach using electrosurgical energy (claim 2) and removal of ablated tissue (claim 9) does not overcome the deficiencies of Rittman, Butz, and Vass as to claim 1 from which claims 2 and 9 depend. Thus, we do not sustain the rejection of these claims.

DECISION

We reverse the rejections of claims 1–14.

REVERSED