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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* SAURAV PAUL, TROY T. TEGG,  
CHOU THAO, and HARRY PURYEAR

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Appeal 2015-001139  
Application 11/966,576  
Technology Center 3700

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Before CHARLES N. GREENHUT, MICHAEL L. HOELTER, and  
ANNETTE R. REIMERS, *Administrative Patent Judges*.

HOELTER, Administrative Patent Judge.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is a decision on appeal, under 35 U.S.C. § 134(a), from a final rejection of claims 1, 3, 4, 6, 8, 9, 11–13, 17–24, and 27–30. App. Br. 16–19, Claims App. Claims 2, 5, 7, 10, 14–16, 25, and 26 have been canceled. Appeal Br. 16–19, Claims App. We have jurisdiction under 35 U.S.C. § 6(b). We AFFIRM.

THE CLAIMED SUBJECT MATTER

The disclosed subject matter “is directed toward a flexible polymer electrode, including a flexible polymer electrode for MRI-guided positioning and RF ablation.” Spec. ¶ 1. Independent claims 1 and 19 are illustrative of the claims on appeal and are reproduced below:

1. An electrode for use on a medical device comprising:
  - a main body of electrically conductive material extending along an axis and comprising a proximal end, a distal end, and a wall disposed about and defining a lumen extending along said axis; and
  - a magnetic resonance imaging (MRI) tracking coil comprising electrically insulated wire that is wound in a plurality of turns that each extend circumferentially around said axis, wherein said MRI tracking coil further comprises an opening configured to receive a portion of the medical device that extends along said axis, wherein said MRI tracking coil is one of:
    - embedded directly within said wall; and
    - disposed directly within said lumen,
  - further wherein said MRI tracking coil is electrically coupled with two wires that are configured to transmit an induced electromotive force to an MRI system when the MRI system is activated, said induced electromotive force being indicative of a location of said MRI tracking coil.
  
19. A catheter, comprising:
  - a shaft comprising an outer wall, said outer wall comprising a distalmost end; and
  - an electrode disposed on said distalmost end of said outer wall of said shaft, said electrode comprising:
    - a main body extending along an axis and comprising a proximal end and a distal end, and a wall disposed about and defining a lumen extending along said axis;
    - an electrical conductor, disposed in and electrically coupled with said main body, configured to provide ablation energy to said electrode; and

a magnetic resonance imaging (MRI) tracking coil disposed in said main body, said tracking coil comprising electrically insulated wire that is wound in a plurality of turns that each extend circumferentially around said axis of said main body, said coil further comprising an opening configured to receive a portion of said shaft that extends along said axis, wherein said MRI tracking coil is distal to said distalmost end of said outer wall of said shaft.

#### REFERENCES RELIED ON BY THE EXAMINER

Tulley                    US 2003/0028095 A1     Feb. 6, 2003  
Ormsby                  US 2007/0066972 A1     Mar. 22, 2007  
Sven Zuehlsdorff et al., *MR Coil Design for Simultaneous  
Tip Tracking and Curvature Delineation of a Catheter*,  
*Magnetic Resonance in Medicine* 52:214–218 (2004)  
(hereinafter “Zuehlsdorff”).

#### THE REJECTIONS ON APPEAL

Claims 1, 3, 4, 6, 8, 9, 11–13, 17, 18, and 20–24 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Claims 1, 3, 4, 6, 9, 11, 12, 17, 18, 20–24, and 27 are rejected under 35 U.S.C. § 103(a) as unpatentable over Ormsby, Tulley, and Zuehlsdorff.

Claim 8 is rejected under 35 U.S.C. § 103(a) as unpatentable over Ormsby, Tulley, Zuehlsdorff, and Howson.

Claim 13 is rejected under 35 U.S.C. § 103(a) as unpatentable over Ormsby, Tulley, Zuehlsdorff, and Dumoulin.

Claims 19 and 27–30 are rejected under 35 U.S.C. § 103(a) as unpatentable over Ormsby and Tulley.

Claims 1, 3, 4, 6, 8, 9, 11–13, 17–24, and 27–30 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1–21 and 23–25 of U.S. Patent No. 8,175,679.<sup>1</sup>

#### ANALYSIS

*The rejection of claims 1, 3, 4, 6, 8, 9, 11–13, 17, 18, and 20–24 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement*

Regarding the written description requirement, the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date. *See Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (citations omitted). In the matter before us, the Examiner finds that both independent claims 1 and 20 “include a new recitation for two wires electrically coupled to both the tracking coil and MR system.” Final Act. 2. In particular, the Examiner finds:

The specification is only found to generally describe a single “electrical conductor” capable of transmitting an EMF to the MR system (specification p. 8, paragraph 25). The original disclosure provided no detail to support and/or enable the express configuration of a single wire, let alone two wires, which would reasonably render them capable of transmitting a location - specific EMF from the tracking coil to the MRI system.

Final Act. 2; However, the Examiner further finds “Figure 1 supports, at best, a first wire 36 and an additional wire of unspecified arrangement, the

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<sup>1</sup> Appellants have not filed a Terminal Disclaimer nor have they provided argument and/or amendment sufficient to overcome the double patenting rejection. *See* App. Br. 15; Ans. 5. Accordingly, we summarily sustain the Examiner’s double patenting rejection.

two wires transmitting some kind of arbitrary signal to the MR system by way of the drawn arrows.” Ans. 6.

In rebuttal, Appellants contend that “Fig. 1 of the instant application [] clearly illustrates a two-wire connection (item 36) between an MRI tracking coil (item 32) and an MRI system (item 34).” App. Br. 13; *see also* Reply. Br. 2–3. Based on this, Appellants contend that “[t]he disclosure of figures contributes to compliance with the written description requirement.” App. Br. 13; *see also* Reply Br. 3.

On this point regarding the use of figures, we agree with Appellants because our reviewing court has indicated that drawings may be used to provide support under 35 U.S.C. § 112, first paragraph. *See Vas-Cath Inc. v. Mahurkar*, 935 F. 2d 1555, 1565 (Fed. Cir. 1991).

Additionally, Appellants reference Paragraph 24 of Appellants’ Specification as providing written support for this limitation. App. Br. 14. Paragraph 24 states, “MRI tracking coil 32 may comprise an electrically insulated wire” and that “MRI system 34 may be responsive to the signal from MRI tracking coil 32.” This same paragraph also states, “another electrical conductor 36 may carry the signal (e.g., EMF) from MRI tracking coil 32 to MRI system 34.” Hence, whether the limitation to “two wires” is understood to refer to Appellants’ “each ‘end’ of the MRI tracking coil [being] coupled to a respective wire” (App. Br. 8; Reply Br. 2) or whether this limitation is understood to refer to the Examiner’s two distinct conductors and not “a single ‘electrical conductor’” (Final Act. 2; Ans. 5–6), Appellants’ Paragraph 24 provides support for either. Accordingly, because the Specification and drawings convey that Appellants were in possession of the presently claimed system, including “two wires” electrically coupled to

both the tracking coil and MR system, as of the filing date of the application, the Examiner's rejection for lack of descriptive support under 35 U.S.C. § 112, first paragraph, cannot be sustained.

*The rejection of claims 1, 3, 4, 6, 9, 11, 12, 17, 18, 20–24, and 27 under 35U.S.C. § 103(a) as unpatentable over Ormsby, Tulley, and Zuehlsdorff*

*Claims 1, 3, 4, 6, 9, 11, 12, 17, 18, 20–22, and 27*

Appellants argue the rejection of claims 1, 3, 4, 6, 9, 11, 12, 17, 18, 20–22, and 27 as a group. App. Br. 6–11. We select independent claim 1 for review with claims 3, 4, 6, 9, 11, 12, 17, 18, 20–22, and 27 standing or falling with claim 1. 37 C.F.R. § 41.37(c)(1)(iv). Claims 23 and 24 are argued separately and are addressed separately below.

Regarding claim 1, the Examiner primarily relies on Ormsby but relies on Tulley for teaching “an MRI tracking coil 208 comprising insulated wire (¶ 109) wound in a” helix and embedded within a cylindrical body. Final Act. 3. The Examiner concludes: “[i]t would have been obvious to a skilled artisan to have included the tracking coil of Tulley ('095) within the body wall of Ormsby ('972), in order to facilitate MR tracking of the ablation catheter within the patient during use.” Final Act. 3.

The Examiner further relies on Zuehlsdorff for teaching a catheter tracking coil L1 “coupled to the MR system via two wires” and that this coil is “capable of transmitting an EMF-induced signal from the coil to the system as some arbitrary indication of the general location of the coil.” Final Act. 4. The Examiner concludes that it would have been obvious in view of Ormsby and Tulley “to include the coupling wires of Zuehlsdorff” and that “such a modification amounts to the combination of known prior art

parts to yield predictable results (i.e., direct connection between the coil and system to facilitate direct inter-element communication).” Final Act. 4.

Appellants address Tully’s single-wire antenna, not Zuehlsdorff’s two wire arrangement (which the Examiner relied upon), contending that Tulley’s “antenna cannot form a complete circuit with an MRI system” and that by “not forming a complete circuit, the antenna of **Tulley** is not capable of providing an induced EMF signal that is indicative of the position of the antenna.” App. Br. 9; *see also* Reply Br. 4–5. As for Zuehlsdorff, Appellants contend: “[u]nder a reasonable interpretation, **Zuehlsdorff** does not teach transmitting an induced EMF indicative of a location of an MRI tracking coil.” App. Br. 10.

Appellants’ arguments are not persuasive. As indicated *supra*, the Examiner relies on Zuehlsdorff for disclosing two wires (that can be used to complete a circuit) and also for an indication of coil location. *See* Figure 1 at page 215 of Zuehlsdorff, and associated text, which address MRI tracking coil “L1” connected by two wires that are capable of transmitting an EMF-induced signal from the coil to the MRI system; *see also* Zuehlsdorff Abstract and subsequent discussion at page 214 of “using inductively coupled RF coils as positive markers” for visualization and location purposes. Furthermore, regarding coil location, Tulley’s antenna not only operates as an antenna but also provides signals indicative of the location or position of the antenna. *See e.g.*, Tulley ¶¶ 11, 12, 22, and 23. According to Tulley: “[i]t is therefore desired in the art to produce a probe that has an antenna suitable to receive and enhance MR images, *that antenna providing signal that renders it visible on an MR image* and suitable for use as an

imaging probe or guidewire.” Tulley ¶ 11 (emphasis added); *see also* Tulley ¶¶ 12, 22, 23, 87, 88.

Further, we agree with the Examiner that modification of Ormsby and Tulley by Zuehlsdorff results in an assemblage of known parts whose combination produces predictable results. Final Act. 4. “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

Appellants also contend that “**Tulley** teaches away from using magnetically-induced signals. *See Tulley*, ¶¶ [0103]-[0104].” App. Br. 9. However, the paragraphs referenced discuss the ability to add shielding “in the form of a balun circuit as is understood in the art” and that “[t]his tuned balun circuit could help to increase the SNR performance and reduce the induced currents on the wire during an RF pulse.” Tulley ¶¶ 103, 104. Appellants do not indicate where either paragraph actually “criticize, discredit, or otherwise discourage the solution claimed” as required. *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Appellant’s contention is not persuasive.

Accordingly, based on the record presented, and for the foregoing reasons, we sustain the Examiner’s rejection of claims 1, 3, 4, 6, 9, 11, 12, 17, 18, 20–22, and 27 as obvious over Ormsby, Tulley, and Zuehlsdorff.  
*Claims 23 and 24*

Claim 23 depends from claim 11 and further recites “wherein said uninsulated portion of said electrically conductive wire is disposed in said lumen and wherein at least part of said uninsulated portion of said electrically conductive wire is configured to engage said wall.” App. Br. 19,

Claims App. Claim 24 depends from claim 11 and further recites “wherein one of said screen, said mesh, said braid, or said fabric of electrically conductive material is disposed in said lumen and wherein at least part of one of said screen, said mesh, said braid, or said fabric of electrically conductive material is configured to engage said wall.” App. Br. 19, Claims App.

In addressing claims 23 and 24, the Examiner finds “embedding the coil in the body as taught by Tulley ('095) constitutes ‘engaging’ as claimed.” Final Act. 4. However, Appellants contend that the Examiner’s rejection is incomplete in that “[t]he Office Action does not address the feature of ‘disposed in the lumen.’” App. Br. 12.

We agree. The Examiner has failed to address this limitation, and as such, has failed to establish a prima facie case of obviousness with respect to claims 23 and 24. Accordingly, based on the record presented, and for the foregoing reason, we do not sustain the Examiner’s rejection of claims 23 and 24 as obvious over Ormsby, Tulley, and Zuehlsdorff.

*The rejection of claims 19 and 27–30 under 35 U.S.C. § 103(a) as unpatentable over Ormsby and Tulley*

*Claims 19, 27, 28, and 30*

Appellants argue the rejection of claims 19, 27, 28, and 30 under 35 U.S.C. § 103(a) as unpatentable over Ormsby and Tulley as a group. App. Br. 11. We select independent claim 19 for review with claims 27, 28, and 30 standing or falling with claim 19. 37 C.F.R. § 41.37(c)(1)(iv). Claim 29 is argued separately and is separately addressed below.

Independent claim 19 is directed to an electrode and to an electrical conductor that is “configured to provide ablation energy to said electrode.” The Examiner relies on Ormsby and Tulley for disclosing the limitations of

claim 19 (Final Act. 5) and further concludes that it would have been obvious to include Tulley's tracking coil "within the body wall of Ormsby ('972), in order to facilitate MR tracking of the ablation catheter within the patient during use." Final Act. 3.

Appellants contend that, alone or in combination, Ormsby and Tulley "do not teach an electrical conductor for the provision of ablation energy and an MRI coil in the same electrode body." App. Br. 11. In particular, Appellants assert: "[i]n **Tulley**, no ablation electrode is disclosed. In **Ormsby**, the 'electrodes' cited in the Office Action (elements 314 and 330) are disclosed as ECG electrodes, not as ablation electrodes. **Ormsby**, ¶¶ [0031]-[0032]." App. Br. 11. Lastly, Appellants contend: "the Office Action does not identify (or even acknowledge the recitation in claim 19 of) how 'said MRI tracking coil is distal to said distalmost end of said outer wall of said shaft' in either **Ormsby** or **Tulley**." App. Br. 11.

Regarding providing ablation energy, the Examiner relies on Ormsby for teaching an RF energy source as specifically "being configured for transmitting ablation energy." Ans. 8 (referencing Ormsby Title, Abstract and ¶ 21). Appellants do not explain how this transmission of ablation energy source cannot be "configured to provide ablation energy to" an electrode as claimed. *See also* Ans. 8. Further, it is noted that the coils disclosed in the references and in Appellants' device are all similarly placed, i.e., distally, and hence Appellants do not explain how the prior art coils fail to be "distal to said distalmost end of said outer wall of said shaft" as claimed. *See, e.g.*, Ormsby, Figure 4 and Tulley, Figure 7.

Accordingly, based on the record presented, and for the foregoing reasons, we sustain the Examiner's rejection of claims 19, 27, 28, and 30 as obvious over Ormsby and Tulley.

*Claim 29*

Claim 29 depends from claim 19 and further recites "wherein said electrical conductor is wound in a plurality of turns that each extend circumferentially around said axis of said main body, said electrical conductor further comprising an opening configured to receive a portion of said shaft that extends along said axis." App. Br. 19, Claims App.

The Examiner finds that "Ormsby further teaches an RF antenna coil 250 wound in a plurality of turns extending circumferentially around the axis of the main body (Figs. 4-5)." Final Act. 5.

Appellants contend that "the Office Action does not identify any reason that a person having skill in the art would be motivated to include both a MRI tracking coil and an electrical conductor configured to provide ablation energy wound within the same electrode." App. Br. 12.

Appellants' argument is not persuasive. The Examiner offers a well-founded reason for doing so, namely, "to facilitate MR tracking of the ablation catheter within the patient during use." Final Act. 3. The Examiner has provided evidence of the coils of claim 29 being found in Ormsby and Tulley and has articulated a logical reason for their combination in a single electrode. Appellants do not explain how this reason to combine fails to provide sufficient articulated reasoning with rational underpinning to support the legal conclusion of obviousness as discussed in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Accordingly, we do not find Appellants' contentions

persuasive of Examiner error. We sustain the Examiner's rejection of claim 29 as obvious over Ormsby and Tulley.

*The rejection of claim 8 as unpatentable over Ormsby, Tulley, Zuehlsdorff, and Howson and the rejection of claim 13 as unpatentable over Ormsby, Tulley, Zuehlsdorff, and Dumoulin*

Given that Appellants make no arguments in support of the patentability of either claim 8 or claim 13, we sustain the rejections of those claims. *Ex Parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) (the Board may treat arguments appellant failed to make as waived).

#### DECISION

We affirm the Examiner's rejection of claims 1, 3, 4, 6, 8, 9, 11–13, 17–24, and 27–30 on the ground of nonstatutory obviousness-type double patenting as set forth by the Examiner.

We reverse the Examiner's rejection of claims 1, 3, 4, 6, 8, 9, 11–13, 17, 18, and 20–24 under 35 U.S.C. § 112, first paragraph.

We affirm the Examiner's rejection of claims 1, 3, 4, 6, 9, 11, 12, 17, 18, 20–22, and 27 under 35 U.S.C. § 103(a) as unpatentable over Ormsby, Tulley, and Zuehlsdorff.

We reverse the Examiner's rejection of claims 23 and 24 under 35 U.S.C. § 103(a) as unpatentable over Ormsby, Tulley, and Zuehlsdorff.

We affirm the Examiner's rejection of claims 19 and 27–30 under 35 U.S.C. § 103(a) as unpatentable over Ormsby and Tulley.

We affirm the Examiner's rejection of claim 8 under 35 U.S.C. § 103(a) as unpatentable over Ormsby, Tulley, Zuehlsdorff, and Howson.

We affirm the Examiner's rejection of claim 13 under 35 U.S.C. § 103(a) as unpatentable over Ormsby, Tulley, Zuehlsdorff, and Dumoulin.

No time period for taking any subsequent action in connection with

Appeal 2015-001139  
Application 11/966,576

this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED