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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte RAY F. LEE, GEORGEANN MCGUNNESS, GLYN JOHNSON,
QUN CHEN, and ROBERT GROSSMAN

Appeal 2018-003600
Application 11/504,570
Technology Center 3700

Before STEFAN STAICOVICI, JEREMY M. PLENZLER, and
RICHARD H. MARSCHALL, *Administrative Patent Judges*.

MARSCHALL, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1, 4–11, 14, 15, 17, 20, 22–26, 28, 36, 44–46, 55–71, 73, and 74. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ We use the word “Appellant” to refer to “Applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as New York University. Appeal Br. 2.

CLAIMED SUBJECT MATTER

The invention relates “to systems and methods for performing parallel MRI of a sample using hyperpolarized gases. Spec. ¶ 2. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A system for performing a parallel magnetic resonance imaging (“MRI”) procedure, comprising:
 - a hyperpolarized gas contrast agent;
 - a phased-array coil arrangement, including (i) a receive coil arrangement that includes a plurality of channels, and (ii) a transmit coil arrangement that includes a plurality of loops, wherein the transmit coil arrangement is different from the receive coil arrangement, and wherein the phased-array coil arrangement is configured to perform the parallel MRI procedure in conjunction with the use of the hyperpolarized gas contrast agent; and
 - an amplification arrangement connected to the phased-array coil arrangement.

Claims Appendix CL-1.²

² Appellant filed the Claims Appendix as part of a Response to Notice of Non-Compliant Appeal Brief (“Response”). Response at CL-1 to CL-10 (dated Oct. 10, 2017). That Claims Appendix reflects the status of the claims after the Examiner entered Appellant’s Amendment to the claims. *See id.* at 1–2; Adv. Act. 1 (dated Jan. 9, 2017).

REJECTIONS³

1. Claims 1, 4–11, 14, 15, 17, 20, 22–26, 28, 36, 44–46, 55–71, 73 and 74 under 35 U.S.C. § 103(a) as unpatentable over Sodickson,⁴ Lee⁵ or Machida,⁶ and Giaquinto,⁷ Kassai,⁸ and Tooker.⁹
2. Claims 1, 4–11, 14, 15, 17, 20, 22–26, 28, 36, 44–46, 55–71, 73, and 74 under 35 U.S.C. § 103(a) as unpatentable over Hardy,¹⁰ Kassai, Giaquinto, Zhu,¹¹ Miller,¹² and Sodickson.

³ Although the Examiner rejected claim 72 for several reasons, we do not include claim 72 as part of the rejections on appeal because Appellant cancelled claim 72 after the Non-final Action. *See* Claims Appendix CL-10; Adv. Act. 1 (noting that claim 72 does not remain rejected).

⁴ D. K. Sodickson, PhD, *Massively Parallel MRI*, Beth Israel Deaconess Med. Ctr. and Harvard Med. School (“Sodickson”).

⁵ U.S. Patent Publication No. 2003/0214301 A1, published Nov. 20, 2003 (“Lee”).

⁶ U.S. Publication No. 2004/0263167 A1, published Dec. 30, 2004 (“Machida”).

⁷ U.S. Patent No. 7,282,915 B2, issued October 16, 2007 (“Giaquinto”).

⁸ U.S. Publication No. 2004/0017195 A1, published January 29, 2004 (“Kassai”).

⁹ A. C. Tooker, *Hardware for Performing Hyperpolarized Imaging on a Clinical MR Imager*, Dept. Elec. Eng’g and Comp. Sci. (MIT Jan. 24, 2002) (“Tooker”).

¹⁰ C. J. Hardy et al., *Large Field-of-View Real-Time MRI with a 32-Channel System*, *Magn. Reson. Med.* 52(4): 878–884 (PMC April 10, 2004) (“Hardy”).

¹¹ Y. Zhu et al., *Highly Parallel Volumetric Imaging With a 32-Element RF Coil Array*, *Magn. Reson. Med.* 52:869–877 (Wiley-Liss, Inc. 2004) (“Zhu”).

¹² G.W. Miller et al., *Hyperpolarized ³He lung ventilation imaging with B₁-inhomogeneity correction in a single breath-hold scan*, *MAGMA* 16:218–226 (2004) (“Miller”).

3. Claims 1, 4–9, 14, 17, 20, 24–26, 44–46, 55–71, 73, and 74 under 35 U.S.C. § 103(a) as unpatentable over Miller, Machida, Sodickson, Giaquinto, and Kassai.
4. Claims 10, 11, 15, 22, and 23 under 35 U.S.C. § 103(a) as unpatentable over Miller, Machida, Sodickson, Giaquinto, Kassai, Lee, and Zhu.
5. Claims 28 and 36 under 35 U.S.C. § 103(a) as unpatentable over Miller, Lee, Giaquinto, Kassai, and Sodickson.
6. Claim 67 under 35 U.S.C. § 103(a) as unpatentable over Lee or Machida and Giaquinto, Kassai, Tooker, and Albert.¹³
7. Claim 67 under 35 U.S.C. § 103(a) as unpatentable over Hardy, Kassai, Giaquinto, Miller, Sodickson, and Albert.
8. Claim 67 under 35 U.S.C. § 103(a) as unpatentable over Miller, Machida, Sodickson, Giaquinto, Kassai, and Albert.

ANALYSIS

Independent Claims

Each independent claim requires a “transmit coil arrangement [that] is different from the receive coil arrangement.” Claims Appendix CL-1 to CL-9; Appeal Br. 30–33. The Examiner finds that “those skilled in the art would recognize the equivalence of providing separate coils to facilitate transmitting and receiving.” Non-Final Act. 7. As an example, the Examiner refers to Kassai’s teaching of transmitter and receiver coils that are “separated from each other.” *Id.* (citing Kassai ¶ 26). The Examiner determines “that it would have been obvious to a person skilled in the art to

¹³ U.S. Patent No. 6,467,479 B1, issued October 22, 2002 (“Albert”).

have included separate transmit and receive coil arrangements described by Kassai as such a modification involves a simple substitution of equivalent elements to yield predictable results (MPEP 2143 and 2144).” *Id.* at 8.

Appellant does not dispute the Examiner’s finding that the applied prior art discloses all of the recited limitations of the claims. Instead, Appellant argues that “the base references . . . all describe the use of a transceiver” and that “there is no teaching, suggestion or disclosure in any of these references to suggest the use of separate transmit and receive coils (e.g., not a transceiver) – as disclosed by Kassai.” Appeal Br. 34– 35. According to Appellant, “the only reason for combining the references as suggested by the Examiner is the presently pending claims,” which is improper use of the “claims as a roadmap.” *Id.*

In response, the Examiner finds that Appellant fails to address the pending rejection and instead improperly addresses the references in isolation rather than in the combination in the rejection. Ans. 3. The Examiner also reiterates the pertinent findings as to Kassai from the rejection, and finds that this amounts to “articulated reasoning to modify the base references (e.g. simple substitution of equivalent elements to yield predictable results).” *Id.* at 4.

Appellant has not established error in any of the Examiner’s findings. Notably, Appellant concedes that Kassai discloses separate transmit and receive coils and does not argue that any of the prior art fails to disclose the limitations in question. Appeal Br. 35. Appellant’s arguments regarding the failure of the base references to disclose the “transmit coil arrangement [that] is different from the receive coil arrangement” limitation address a point conceded by the Examiner, and fail to address the Examiner’s findings

and the proposed modification of those references based on Kassai's teachings. *Id.* at 34. Appellant's argument appears to be holding the Examiner to the old teaching, suggestion, or motivation ("TSM") standard; such a standard is not required. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415 (2007). The proper inquiry is whether the Examiner has articulated adequate reasoning based on rational underpinnings to explain why a person having ordinary skill in the art would combine the teachings of the applied prior art. *See id.* at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Although Appellant argues that the Examiner erred by combining Kassai's teachings with the other prior art, Appellant never addresses the Examiner's stated reason for the combination—that it involved "substitution of equivalent elements to yield predictable results." Non-Final Act. 8; Ans. 4. We discern no error in these unrebutted findings.¹⁴ Based on the foregoing, we sustain the rejections of the independent claims.

Dependent Claims

Appellant relies on the same arguments for the rejections of the dependent claims as for the independent claims. *See* Appeal Br. 36. Accordingly, we sustain the rejections of the dependent claims for the same reasons discussed above.

¹⁴ Kassai itself supports the Examiner's findings by describing the use of the same or separate coils to transmit and receive, without noting any substantive difference between the two approaches. *See* Kassai ¶ 26 ("Transmitter coil 15 and receiver coil 16 may be separated from each other as shown in FIG. 1, or may be the same coil.").

Objections to Drawings

Appellant argues that certain objections the Examiner made to the drawings were improper, and “should be withdrawn.” Appeal Br. 29–30. We do not have jurisdiction to address such objections, which involve issues addressed by petition, not appeal. *See* MPEP 1002.02(c) (including “objections or requirements made by the examiners” as a petitionable matter).

CONCLUSION

We sustain the Examiner’s rejections of claims 1, 4–11, 14, 15, 17, 20, 22–26, 28, 36, 44–46, 55–71, 73, and 74. We do not reach Appellant’s arguments related to the objection to the drawings.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Basis	Affirmed	Reversed
1, 4–11, 14, 15, 17, 20, 22–26, 28, 36, 44–46, 55–71, 73, 74	103(a)	Sodickson, Lee, Machida, Giaquinto, Kassai, Tooker	1, 4–11, 14, 15, 17, 20, 22–26, 28, 36, 44–46, 55–71, 73, 74	
1, 4–11, 14, 15, 17, 20, 22–26, 28, 36, 44–46, 55–71, 73, 74	103(a)	Hardy, Kassai, Giaquinto, Zhu, Miller, Sodickson	1, 4–11, 14, 15, 17, 20, 22–26, 28, 36, 44–46, 55–71, 73, 74	
1, 4–9, 14, 17, 20, 24–26, 44–46, 55–71, 73, 74	103(a)	Miller, Machida, Sodickson, Giaquinto, Kassai	1, 4–9, 14, 17, 20, 24–26, 44–46, 55–71, 73, 74	

Claims Rejected	35 U.S.C. §	Basis	Affirmed	Reversed
10, 11, 15, 22, 23	103(a)	Miller, Machida, Sodickson, Giaquinto, Kassai, Lee, Zhu	10, 11, 15, 22, 23	
28, 36	103(a)	Miller, Lee, Giaquinto, Kassai, Sodickson	28, 36	
67	103(a)	Lee, Machida, Giaquinto, Kassai, Tooker, Albert	67	
67	103(a)	Hardy, Kassai, Giaquinto, Miller, Sodickson, Albert	67	
67	103(a)	Miller, Machida, Sodickson, Giaquinto, Kassai, Albert	67	
OVERALL OUTCOME			1, 4–11, 14, 15, 17, 20, 22–26, 28, 36, 44–46, 55–71, 73, 74	

FINALITY AND RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED