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Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO. Includes application details for Alan H. Ouye and examiner information for CHARLEE BENNETT.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ALAN H. OUYE, GRAEME SCOTT, KEVEN KAISHENG YU,
and MICHAEL N. GRIMBERGEN

Appeal 2019-000208
Application 13/253,627
Technology Center 1700

Before BRIAN D. RANGE, MICHAEL G. McMANUS,
and MERRELL C. CASHION, JR., *Administrative Patent Judges*.

McMANUS, *Administrative Patent Judge*.

DECISION ON APPEAL

The Examiner finally rejected claims 1, 3–5, 8, 9, and 14–16 of Application 13/253,627 under 35 U.S.C. §§ 103 and 112. Final Act. (Nov. 27, 2017) 4–13. Appellant¹ seeks reversal of the rejections pursuant to 35 U.S.C. § 134(a). We have jurisdiction under 35 U.S.C. § 6(b).

For the reasons set forth below, we REVERSE.

¹ We use the word “Appellant” to refer to “Applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Applied Materials, Inc. Appeal Br. 3.

Figure 2 of the Application shows a plasma processing chamber 100 having a lid heater assembly 190. *Id.* ¶ 21. Coil elements 113 are positioned above the lid to maintain the plasma 106 formed from the process gasses. *Id.* ¶ 25. It can be seen that heating element 198 is positioned at the outer portion of the lid heater assembly.

Claim 1 is illustrative of the subject matter on appeal and is reproduced below with certain limitations bolded for emphasis:

1. A lid heater assembly for a plasma processing system having a **coil assembly** positioned above the lid heater assembly, comprising:

a thermally conductive base, wherein the thermally conductive base is a planar ring defining an inner opening, wherein the **inner opening has a diameter larger than an outer diameter of the coil assembly**;

a heating element disposed on the thermally conductive base;

an insulated center core disposed across the inner opening of the thermally conductive base;

a thermal insulator disposed over the heating element;
and

an RF shield which is a ring without a gap and is disposed between and in contact with the heating element and the thermal insulator.

Appeal Br. 17 (Claims App.) (emphasis added).

REJECTIONS

The Examiner maintains the following rejections:²

1. Claims 1, 3–5, and 8 are rejected under 35 U.S.C. § 112, second paragraph, for failure to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Final Act. 4.
2. Claims 1 and 3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Willwerth et al.³ in view of Qian et al.,⁴ and Chen et al.⁵ *Id.* at 5–7.
3. Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Willwerth in view of Qian, Chen, and Collins et al.⁶ *Id.* at 8.
4. Claims 5 and 8 are rejected under 35 U.S.C. § 103(a) as obvious over Willwerth in view of Qian, Chen, Collins, and O’Carroll et al.⁷ *Id.* at 8–9.
5. Claims 9 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Willwerth, Qian, and Chen. *Id.* at 9–12.
6. Claims 14 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Willwerth, Qian, Chen, and O’Carroll. *Id.* at 12–13.

² We cite to the pre-AIA versions of 35 U.S.C. because the effective filing date for the application from which this appeal is taken is before the effective date of the AIA legislation of March 16, 2013.

³ US 2009/0236315 A1, published Sept. 24, 2009 (“Willwerth”).

⁴ US 6,447,636 B1, issued Sept. 10, 2002 (“Qian”).

⁵ US 2002/0185228 A1, published Dec. 12, 2002 (“Chen”).

⁶ US 6,238,588 B1, issued May 29, 2001 (“Collins”).

⁷ US 2002/0084424 A1, published July 4, 2002 (“O’Carroll”).

DISCUSSION

Rejection 1. The Examiner rejected claims 1, 3–5, and 8 as indefinite. *Id.* at 4. The Examiner determines that claim 1 is indefinite due to the recitation of a “coil assembly” in the preamble and the body of the claim. *Id.* The Examiner reasons that the claim is stated to be directed to a “lid heater assembly” and the coil assembly components “are not a part of the lid heater assembly.” *Id.* In the Answer, the Examiner further asserts that “the heated lid assembly, which does not include the coil assembly, cannot be limited or defined by a non-existing structure which has no boundaries/limitless boundaries (‘outer diameter of the coil assembly’) in the body of the claim (outside the preamble).” Answer 12.

In its Appeal Brief, Appellant argues that “[t]he outer diameter of the coil assembly is used as a reference to the size of the diameter of the inner opening.” Appeal Br. 8. As a result, Appellant reasons, “the component ‘coil assembly’ is not an element to the lid heater assembly, it is merely a reference used to define the diameter of the inner opening.” *Id.*

During prosecution, a claim is examined for compliance with 35 U.S.C. § 112, second paragraph, by determining whether the claim meets threshold requirements of clarity and precision. *In re Skvorecz*, 580 F.3d 1262, 1268 (Fed. Cir. 2009) (quoting MPEP § 2173.02). A claim should be rejected as indefinite when it is amenable to two or more plausible claim constructions. *In re Packard*, 751 F.3d 1307, 1324 (Fed. Cir. 2014) (“There are good reasons why unnecessary incoherence and ambiguity in claim constructions should be disapproved”).

The Examiner does not determine that one of ordinary skill in the art would not understand the meaning of the term “coil assembly.” In any case,

the Specification and figures give adequate guidance as to the scope of “coil assembly.” Spec. ¶¶ 10, 12; Figs. 2, 4. Rather, the Examiner determines that the preamble (“[a] lid heater assembly”) excludes the coil assembly (separate from the lid heater) from the scope of the claim.

This is not consistent with the law of claim construction. In *IMS Tech., Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 1427 (Fed. Cir. 2000) the Federal Circuit construed a similar preamble not to exclude a recited limitation from the scope of the claim. There, the claim at issue (claim 1) included a preamble reciting “[a] programmable microcomputer control apparatus for controlling the relative motion between a tool and a workpiece comprising” *Id.* at 1427. The patent owner argued that the district court had improperly limited the claim to a “control system for machine tools rather than an entire machine tool apparatus.” *Id.* at 1434. The Court agreed as follows:

The phrase “control apparatus” in the preamble merely gives a descriptive name to the set of limitations in the body of the claim that completely set forth the invention. Its use does not limit the claims, as Haas contends, to a control apparatus that is separate from the machine tool.

Id. at 1434.

Similarly, the term “lid heater” does not negate the “coil assembly” limitation. Accordingly, we determine that Appellant has shown reversible error in the rejection of claims 1, 3–5, and 8 as indefinite.

Rejection 2. The Examiner rejected claims 1 and 3 as obvious over Willwerth in view of Qian and Chen. Final Act. 5–8. The Examiner finds that Willwerth and Qian teach each element of claims 1 and 3 except “the

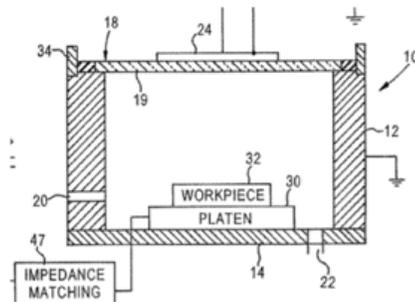
inner opening has a diameter larger than an outer diameter of the coil assembly.” *Id.* at 7. The Examiner finds that “Chen discloses a coil assembly (24 [coil], Fig. 1) being surrounded by a conductive base (34 [metal shield]) having an inner diameter somewhat greater than the inner diameter of chamber wall (12) for the purpose of defining the boundary for the electromagnetic fields generated by the coil.” *Id.* The Examiner further finds that one of ordinary skill in the art would have had reason to modify the teachings of Willwerth and Qian “to incorporate the diameter configuration of Chen to the coil assembly and inner diameter configuration of the conductive base taught by Willwerth in view of Qian” so as “to define the boundary for the electromagnetic fields generated by the coil.” *Id.*

In the Answer, the Examiner further describes the basis of the rejection.

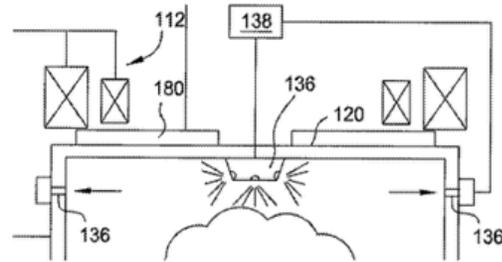
Chen is not relied upon to teach a thermally conductive base having an inner diameter, as Willwerth already teaches a thermally conductive base having an inner diameter. Chen is relied upon to teach the concept of having the thermally conductive base (34) have an inner diameter somewhat greater than the inner diameter of the chamber wall (12) as explicitly taught in para. [0036] of Chen (as previously rejected), which renders the base inner diameter to surround the coil as shown in Fig. 1 of Chen. Chen teaches this for the purpose of defining the boundary for the electromagnetic fields generated by the coil, and this motivation is analogous to the present invention’s motivation, taught in the application specification para[s]. [0036] and [0042], where it states that the reason for the outer diameter surrounded by inner opening inner diameter is to avoid interference with coupling between antenna and plasma.

Answer 13–14.

Appellant argues that one of ordinary skill in the art would not have been led to the claimed configuration by the teachings of Chen and Willwerth. Appeal Br. 9–11. Portions of figures from Chen and Willwerth are reproduced from Appellant’s opening brief below.



Chen



Willwerth

The excerpt of Figure 1 of Chen (left) shows a vacuum plasma processor including coil 24 positioned above chamber 10 and shield 34 which is stated to “decouple[] electromagnetic fields originating in coil 24 from the surrounding environment.” Chen ¶¶ 30–36. The excerpt of Figure 1 (right) of Willwerth shows a plasma processing chamber including shielded lid heater 180 positioned on lid 120. Willwerth ¶¶ 25–26. “Above the lid 120 is disposed an antenna 112 comprising one or more inductor coil elements.” *Id.* ¶ 29.

Appellant contends that, if one were to combine the teachings of Willwerth and Chen “the shield 34 would be position[ed] outward of the lid and the lid heater of Willwerth because the shield 34 of Chen is for shielding to the outside environment, and not for shielding a lid heater.” Appeal Br. 10. Appellant further argues that “a person skilled in the art would not be motivated to modify either the heater 180 or the antenna 112 so the inner

diameter of the heater 180 is configured to circumscribe the outer diameter of the antenna 112.” *Id.* at 11.

In its Reply Brief, Appellant argues that “a person skilled in the art would at most add shield 34 to the chamber of Willwerth in the position taught by Chen.” As a result, “the shield 34 would be positioned outward of the lid and the lid heater of Willwerth because the shield 34 of Chen is for shielding to the outside environment, and not for shielding a lid heater.” Reply Br. 4 (emphasis omitted).

The point at issue is whether a person of ordinary skill in the art would have had reason to modify the device of Willwerth such that shielded lid heater 180 is located at the periphery of the lid rather than in the position taught by Willwerth (Fig. 1). The Examiner proposes that one would have done so to “defin[e] the boundary for the electromagnetic fields.” Answer 13. The Examiner, however, does not cite any support in the references (or elsewhere) that the shielded lid heater of Willwerth would have been suitable for such function. Absent such a showing, we cannot conclude that a person of ordinary skill in the art would have had reason to modify Willwerth as proposed by the Examiner. In view of the foregoing, Appellant has shown error in the rejection of claims 1 and 3 as obvious.

Rejections 3–6. The Examiner rejects claims 4, 5, 8, 9, and 14–16 as obvious over the teachings of Willwerth and Chen in combination with other references as detailed above. Final Act. 8–13. Appellant argues that the rejections of claims 4, 5, 8, 9, and 14–16 should be reversed for the same reasons articulated with regard to Rejection 2. As we have found such

arguments to be persuasive, we determine that Appellant has shown reversible error in this regard.

CONCLUSION

For the reasons stated by the Examiner in the Final Office Action and the Examiner’s Answer as well as those reasons set forth above, we determine as follows:

Claim(s) Rejected	Basis	Affirmed	Reversed
1, 3–5, and 8	§ 112, second paragraph		1, 3–5, and 8
1 and 3	§ 103(a) Willwerth, Qian, and Chen		1 and 3
4	§ 103(a) Willwerth, Qian, Chen, and Collins		4
5 and 8	§ 103(a) Willwerth, Qian, Chen, Collins, and O’Carroll		5 and 8
9 and 16	§ 103(a) Willwerth, Qian, and Chen		9 and 16
14 and 15	§ 103(a) Willwerth, Qian, Chen, and O’Carroll		14 and 15
Overall Outcome			1, 3–5, 8, 9, and 14–16

REVERSED